MARINE REVIEW.

VOL. XV. CLEVELAND, O., MARCH 25, 1897. No. 13.

Hull Insurance.

It is expected that the several general agents of insurance companies in Chicago, Milwaukee and Buffalo, who have withheld the hull tariff much longer than usual this spring, on account of the new firm of Charles E. & W. F. Peck of Chicago coming into the business, will annouce their rates about Saturday of this week. Notwithstanding the small aggregate of losses on the lakes during 1896, a great cry is being raised about London underwriters suffering very heavy losses of late on the Atlantic, and a stiff market in London is to be held up as the excuse for higher rates on the lakes. In letters to vessel owners the general agents all say that the best rates to be had from London on the English form of policy are 4 per cent. for steel and iron steamers, 4½ per cent. for composite steamers and steel barges, and 5 per cent. for the best class of wooden steamers. These figures represent an advance over last year of almost 1 per cent. all around.

The general agents do not say that their tariff will be up to these rates, but they claim that all insurance on the lakes in the future will be governed by London quotations. They say, also, that the advance in rates at Lloyds has proven a set-back to the new hull combination headed by Peck & Peck, and that the combination has been unable, on account of the higher rates demanded by underwriters for lake business, to secure the support from large companies which they had counted upon. It must be said in justice to the combination, however, that they have made no public claims of big companies at their command, and that they seem to be proceeding, just as their com petitors are, in a cautious way with a view to securing as large a share of the hull business as it is possible for them to obtain. The work on their Great Lakes Register is being prosecuted as fast as it is possible to conduct the surveys and get data together, but as the register will include fully 3,000 lake vessels, and as the work is being conducted very thoroughly down to the smallest details, it will require eight months or probably a year more of labor before the entire matter can be gotten into print.

Charles Macdonald of Chicago, who went to London, some time ago, to look after his own interests, as well as those of Smith, Davis & Co., and probably other general agents, is expected home in a few days. His return will probably be the signal for a general effort on the part of the old concerns to do some business. It is not probable, however, that vessel owners will be in much of a hurry to place their insurance, especially in view of the proposed higher rates. They will probably hold off as long as possible for further developments in the fight which the underwriters will make for business. One of the agents who has been to England says there is a very strong feeling among underwriters at Lloyds against methods that are said to prevail among certain insurance brokers in this country who place the great bulk of their business at Lloyds. The British underwriters say that some of the charges made for adjustments and other matters connected with the settlement of losses are grossly exorbitant. They say they are informed that these brokers have actually taken insurance at prices lower than they had to pay for placing it in England, but depended in such cases upon charges which they would afterwards put in against the underwriters.

Improvements being made by the Milwaukee Dry Dock Co. in preparation for the repair of steel ships will involve an expenditure of $30,000. It is expected that the new plant will be in readiness in May. The tools that have been purchased are of the largest and best kind. The company announces, also, that they will be prepared when the plant is complete to submit proposals on new steel vessels as well as on repairs.

In addition to the steamer J. W. Moore, Mr. John Gordon will have the Wilson steamers Olympia and Tower in his Manitowoc-Buffalo line during the coming season. The vessels have been chartered at a fixed sum for the season. Mr. Gordon is also figuring on other vessels for this line.

Iron Ore Pool.—Lake Freight Matters.

Alhough a meeting in Cleveland, Tuesday, of representatives of the various iron mining companies of the Lake Superior region resulted in a dissolution of last year's ore pool, as far as the large interests of the Mesabi range are concerned, an effort is still being made to form a pool of mines producing Bessemer ore on the old ranges, along the lines of the association that existed in 1895, and the Cleveland ore dealers say that there is every reason to expect that an agreement between all companies other than those of the Mesabi will be fully entered into early next week. In the meantime there is absolutely nothing doing in the way of sales of ore and consequently no definite talk of lake freights. Vessel owners are generally of the opinion that their interests would be best served if the efforts to form a pool of the old range mines should also fall through. The Illinois Steel Co. recently secured bids on 450,000 tons of ore, to be moved from Escanaba to South Chicago, Chicago and Milwaukee, and it is reported that the contract was secured by Mr. A. B. Wolvin of Duluth, but the report is not from a definite source. The ore, which is largely from mines controlled by the Chicago company, was probably taken at a rate of about 25 cents, as there was considerable competition for the contract and the vessels pay no unloading charges. Two or three Cleveland coal shippers have cargoes of soft coal for the head of Lake Superior, but it is understood that they are offering only 30 cents.

Canadian Enterprise.

The announcement from Ottowa that the new government in Canada has definitely decided to complete within two years the work of deepening all of the St. Lawrence canals to 14 feet is a matter of the greatest importance to the grain trade of the lakes. Capt. Alex. McDougall, who is said to have made a special trip to Ottawa in the interest of this improvement, has for some time past had in view the organization of a big corporation, to build and operate vessels specially suited to the improved St. Lawrence canals.

Information given out within the past few days regarding the new steamship line is also thought to be entirely reliable. It is announced that the Laurier government has finally settled the matter of a fast Atlantic express service by awarding a ten-year contract to the English firm of Peterson, Tait & Co. of Newcastle, to place on the route between Montreal and Liverpool four steamships of 10,000 tons each, and a speed slightly exceeding twenty-one knots. Two of the new boats are to be ready for the beginning of the season of 1899, and the other two in 1900. The ships will be equal, it is said, to the best of the Atlantic liners entering New York. They will run from Montreal, or possibly Quebec, to Liverpool in the summer, and from Halifax in the winter. It is said that the annual subsidy to be paid by the dominion is $500,000, to which the imperial government will add $250,000.

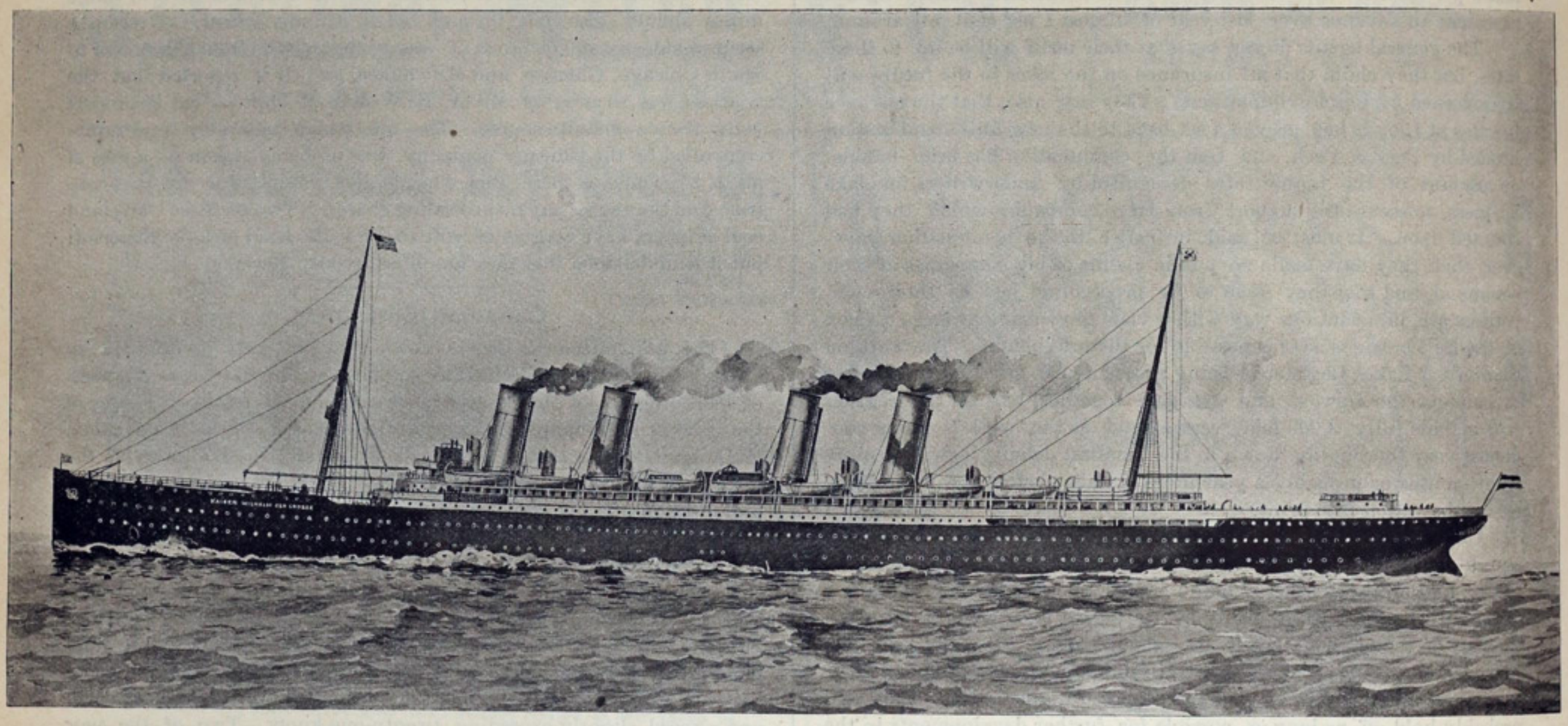
As a result of persistent efforts on the part of officers of the Lake Carriers' Association to secure gas buoys as aids to navigation in connecting channels and on dangerous lake shoals, there will be at least ten of these buoys at different points throughout the lakes by May 1 of this year. Nothwithstanding the failure of the sundry civil bill in the last congress, and consequent delay with buoys provided for in that bill, it is understood now that the officers of the light-house board have managed to secure several gas buoys for the lakes, which will be in position by May 1. The points to be covered include Ballard's reef on the Detroit river, as well as Fisherman's shoal, Poverty passage and Lansing shoal, Lake Michigan. Notice is also given of a gas buoy, showing a fixed white light, that will on the opening of navigation mark the south-east of the inner entrance to the straight channal, Maumee bay, in the position heretofore occupied by spar buoy No. 29.

A neat invitation from the Globe Iron Works Co., Cleveland, announces that the steel schooner Sidney G. Thomas, another vessel for the Rockefeller fleet, will be launched Saturday at 11 a. m.

The New German Express Steamers.

It is expected that one of the principal events in Germnay this week, in connection with the celebrationof of the one-hundred anniversary of the birth-day (March 22) of the great emperor, William the first, will be the launching of one of the large twin-screw express steamers building for the North German Lloyd Co.'s Bremen-New York service. This steamer is building at the Vulcan Iron Works, Stettin, and will be equal to the finest of the great Atlantic liners. She will represent the highest attainments of German builders, and will cost about $4,750,000. Another steamer of equal value and about the same dimensions is being built by F. Schichau at the Danzig yard, but the vessels will not be duplicates, as they were contracted for on builders' plans. The Kaiser Wilhelm der Grosse is 625 feet between perpendiculars, 66 feet beam and 43 feet moulded depth. She is expected to develop 28,000 horse power and the guaranteed speed is 22 knots. Her twin-screw engines are of the four-cylinder, triple expansion type, with cylinders 52, 90 and 97 (two) inches diameter, the stroke being 69 inches. The working pressure in boilers will be about 185 pounds per square inch. The engines are designed for seventy-seven revolutions per minute, with cut off at .72 of the stroke.

One of the leading American manufacturers of pumping machinery, the Geo. F. Blake Co. of New York, has furnished for this steamer two main air pumps, as well as nine other pumps that will be used for different purposes on the ship. The big pumps are of a type that is claimed to be the largest of their kind in the world. The Germans became interested in them during the marine exhibition at Kiel, when the United States cruiser New York, which has independent air pumps of the Blake type, excited considerable interest among naval experts. This type of pump, which is also illustrated in the opposite page, is compact and simple in design. It has two double-acting steam-cylinders, 18 inches in diameter, and two single-acting air cylinders, each 44 inches in diameter, the stroke being 24 inches. There are two pumps of this size on the Kaiser Wilhelm der Grosse and they have a capacity at moderate speed sufficient to take care of the main engines when the latter develop 28,000 horse power. When these pumps were tested at the works of the George F. Blake company, some months ago, they formed a vacuum of 28¾ inches with temperatures of vapor and condensed steam at about 80 degrees Fahr., with the pumps working at a very moderate speed. The pumps were run up as high as 75 double strokes per minute, and operated as smoothly and quietly as they did at the rate of one double stroke per minute. Although they were not bolted to the floor, they worked without any vibration, showing that the working parts were well balanced and that the machine is perfectly self-contained. Although the Blake vertical "twin" system has shown an economy on the United States cruisers and battleships averaging about ⅛ of 1 per cent. of the I. H. P. of the main engines, it is fully expected that the big air pumps on the new German steamer will break the record in the matter of economy. It is calculated that they will not require less than 1-10 of 1 per cent. of the I. H. P. of the main engine.



NEW GERMAN EXPRESS STEAMER KAISER WILHELM DER GROSSE.

New Lights.

Two new lights on the Detroit river, to be known as the Grassey island north channel ranges, will be established about April 1. The front light will be red and the structure in which it will be established has been erected in 3½ feet of water near the northerly end of the flats lying to the northward and westward of Grassey island. The structure is of wood, painted yellowish drab, and the light will be about 30 feet above the mean level of the river. The rear light of the range will also be red and located in a yellowish drab tower, but this second tower will be 50 feet above the mean level of the river. These lights will mark a range line for running the channel of the Detroit river between the Ecorse range line and Detroit. The range line clears the 18-foot curve off the northwesterly part of Fighting island by about 400 feet, off Ecorse marsh by about 500 feet, and the point of the Canadian shore opposite Fort Wayne by about 500 feet. The range line intersects the Ecorse range line at a point about 3,500 feet from the Ecorse range front light, and about 3,150 feet from the front light of this range.

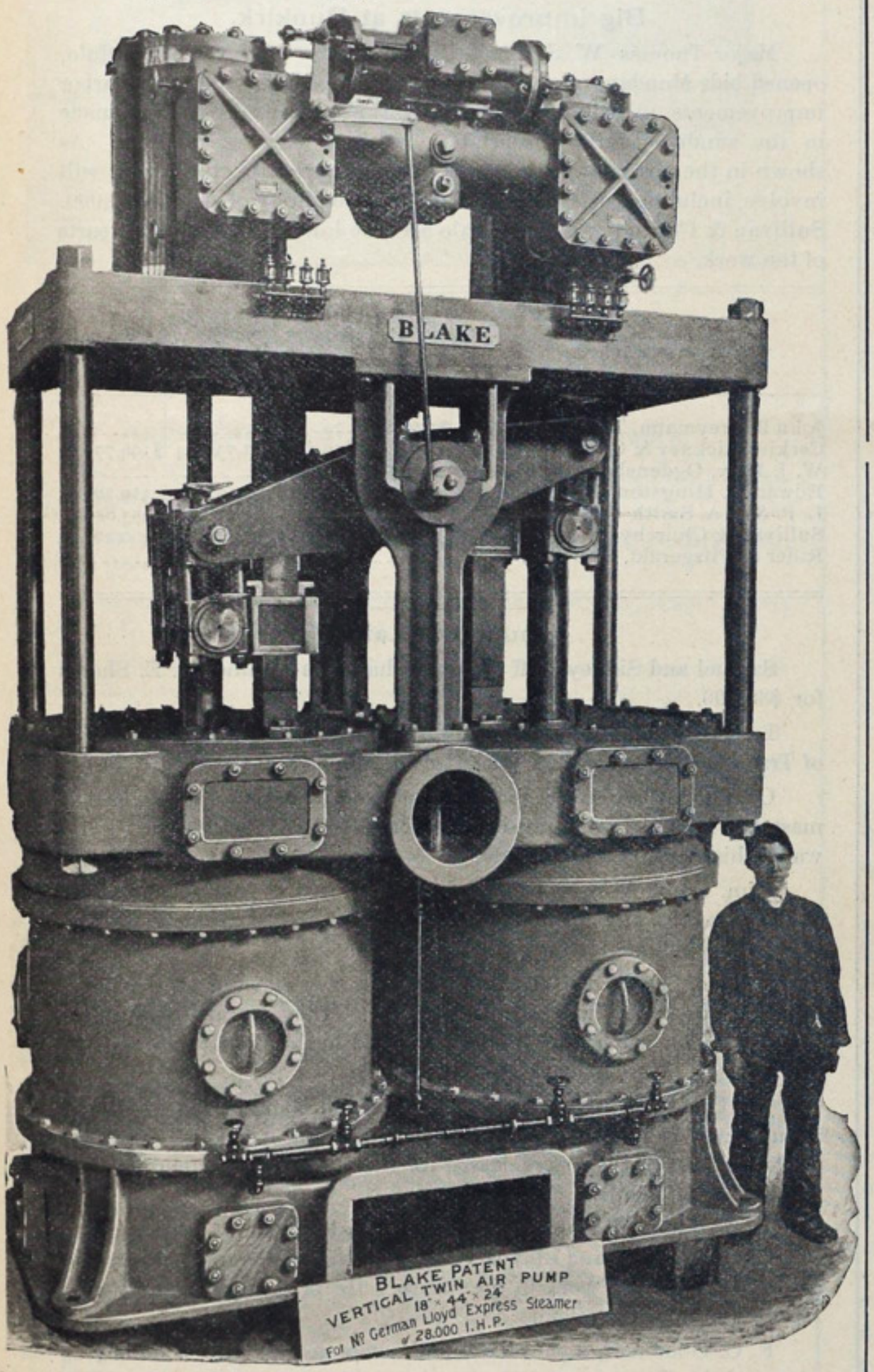
On the opening of navigation the color of the fourth-order light at Two Harbors, Lake Superior, will be changed from red to white and the color of the lantern light on the outer end of the breakwater making off from the point will be changed from white to red.

Some exaggerated reports have been printed about the big new steamer Oceanic, which Harland & Wolff of Belfast are to build for the White Star line. It is true, however, that this steamer will be 704 feet long, or 65 feet longer than the Great Eastern. She will be able to steam twelve knots for 23,400 nautical miles, or practically round the world without coaling. The tonnage hitherto turned out by Harland & Wolff for the White Star line reaches a total of 155,195 tons, and the famous Belfast firm have now in hand for the same line new steamers amounting to no less than 103, 885 tons.

Solid through sleeping car trains with dining cars attached are operated by the Nickel Plate road between Chicago, Cleveland, Buffalo and New York City. Through sleeping car to Boston. 3 Mar 31

Commercial Side of the Ship-Canal Question.

As noted in the Review a short time ago, Major Thomas W. Symons, United States engineer at Buffalo, is investigating what may be termed the commercial side of the proposition to construct a ship-canal from the lakes to tide water at New York. The report of the Deep Waterways Commission, recently submitted to congress, was confined to a discussion of routes and to engineering questions involved in the proposition. The future work of this commission, or similar commissions, will have to do with surveys, cost, etc.; but the engineer officers of the war department, having an appropriation for investigation of the canal question, decided to apply it to a study of the practical, business proposition that is involved in the whole matter, and Major



BLAKE PATENT VERTICAL TWIN AIR PUMP.

Symons' report along this line is certain to prove very interesting. He has had two engineers at work among vessel owners and shippers in lake cities for several weeks past, collecting information pertaining to freight charges, cost of operating the largest lake vessels, time of trips and time in port, cost of handling freight and everything else that may have a bearing on the subject. He has also sought similar information through letters sent to a large number of people interested in lake navigation and conversant therewith. A copy of one of these letters, which follows, will give an idea of the thorough manner in which the subject is being handled:

"The United States government is seriously considering the advisability of constructing a ship canal to connect the waters of the great lakes with tide water at New York. The route which is regarded as most favorable is from Lake Erie down the Niagara river to a little below Tonawanda; thence by a canal twenty-five miles long with about fifteen locks to Lake Ontario at Olcott; through Lake Ontario to Oswego, thence twenty-eight miles by the canalized Oswego and by canal proper with six locks to Oneida Lake; thence through Oneida Lake twenty-two miles; thence by fifty miles of canal with five locks to the Mohawk river at Little Falls; thence by the Mohawk river canalized with about sixteen locks to the Hudson at Troy; thence by the Hudson with its channels properly improved to New York.

"The canal and locks would be of ample size for the largest vessels running on the lakes when all interlake channels are made deep enough for the acommodation of vessels of twenty feet draft. The canal and canalized river channels would have a depth of not less than 22 feet and at this depth be not less than 144 feet wide. There would be in the route about 134 miles of lake navigation, 131 miles of open river, thirty miles of artificial channel in the Hudson, ninety-five miles of small river canalized, and ninety-three miles of canal—483 miles in all—with about forty-two locks. The construction of such a canal is considered to be feasible as an engineering proposition.

"Upon the questions relating to the use of this water route from the lakes to New York and return by lake vessels and particularly by fully loaded large steel vessels of late type, as a practical and business proposition, your opinion as a vessel manager and navigator is desired.

"What practical difficulties, if any, are there in the way of navigating such a canal and running large lake steamers between lake ports and New York?

"Would you willingly permit a large lake steamer controlled by you to make a business of running on this route?

"Is it your opinion that vessels navigating such a canal would be subjected to any extra hazards over what they now have to encounter on the lakes and interlake channels?

"Would insurance rates on vessels and cargoes which make a regular business of running through the canal probably be changed, and in what direction and how much?

"Would any changes be necessary in lake vessels to fit them for the business, and in what would they consist?

"Assuming that the canal regulations permit a speed of four to five miles per hour through the canal portion of the route, and making fair allowance of time for lockages, slowing down in the rivers, port delays at New York, and chances of detention of all kinds; also taking into consideration the chance for return cargoes, would a large modern lake steamer be most advantageously employed by running direct from Duluth or Chicago to the Atlantic seaboard, and there discharging with transshipment there, or running to Buffalo or Oswego with transshipment there?

"Assuming the conditions to be as stated in the foregoing question, what in your opinion would be a fair rate of freight for the carriage of a bushel of wheat from Chicago through to New York by a large modern lake steamer?

"Leaving out of consideration any military advantages, is it your opinion, as a practical business man owning or managing vessels, that the proposed deep water routes from the great lakes to the Hudson ought to be built by the United States government?

"I should be very much pleased to hear from you in answer to the above questions and to receive from you any further views on the subject with which you may favor me."

Major Symons will, of course, be pleased to receive communications along the lines suggested from vessel men or others interested in the subject who may not have received a copy of the foregoing letter.

An excellent chart of Green bay and approaches, on a large scale, has just been published by the United States Hydrographic office and may be had from the Marine Review. The chart is corrected to March 1, 1897, and takes in with Green bay the west shore of Lake Michigan from Manistique to Kewaunee. It will be of great value to masters of Lake Michigan trading vessels, as well as the men in charge of the larger ore and coal carriers trading to Escanaba. Soundings are in feet and there is a scale of statute miles attached. The price is $1.25, but the chart is so complete in detail that it is larger than the single sheet charts of Lake Superior or Lake Michigan.

The Review has excellent photographs of lake ships.

More Mystery in the Steamboat Rules.

In the Review of the 11th inst. attention was directed to a new rule pertaining to licenses of deck officers, which was adopted by the United States supervising inspectors of steam vessels at their meeting in Washington in January last. The rule is as follows: "No original first-class pilot license shall be issued hereafter to any person who has not been licensed and served at least one full season of eight months as a second-class pilot on steamers, such service as second-class pilot to have been within two years preceding the application for such license." It would seem that according to this rule an applicant for a license as first-class pilot, (a man from a sailing vessel for instance), no matter how competent he may be, can not secure such license until he has served one full season as second-class pilot on a steamer. It would seem, also, that although such an applicant may be entitled to papers as master of a steamboat he could not, according to this rule, obtain a license as first-class pilot, and neither could he, according to the only construction that it seems possible to put on the rule, obtain a joint license as master and first-class pilot. With a view to learning the cause for the adoption of the rule, the Review wrote Gen. Dumont at Washington and his reply is as follows:

"In response to your note of the 13th instant, I desire to say that I had read the editorial to which you refer, in the matter of the new rule relating to the issuance of pilot licenses on the northwestern lakes. I would say, first, that the principle of the rule referred to is in accordance with the general practice throughout the United States, except perhaps on the waters to which the rule is made to apply. Therefore, when Supervising Inspector Galvin of the ninth district (Buffalo) offered the resolution embodying the rule to which objection is made in your article, it excited no comment in the board, as it was naturally supposed that there was some reason in his mind indicating a necessity for a binding rule on the lakes conforming to the practice elsewhere. As there was no debate on the subject matter of the rule when it was adopted, I am unaware of the exact reasons Mr. Galvin had for presenting it to the board, therefore would suggest that a copy of your editorial be sent to him, and I have no doubt he will be glad to explain its necessity. As for myself, if it should be found that the rule is justly obnoxious and opposed to the best interests of navigators on the lakes, I shall move its repeal at the next meeting of the board."

Following this explanation the supervising inspector-general gives the full text of the resolution as introduced by Capt. Galvin and notes the vote which was unamimous in favor of the rule.

Acting upon the suggestion from General Dumont, the Review wrote to Capt. M. J. Galvin, supervising inspector at Buffalo, and he replied as follows: "The resolution as offered by me and passed by the board of supervising inspectors of steam vessels this winter does not apply to masters of sailing vessels navigating the lakes. The law already provides for them. It applies only to second-class pilots who have original second-class pilot licenses and who have not served under said licenses. At the end of a year they come before the local inspectors for examination for first-class pilot licenses. They can show no service in the deck department as second-class pilots, but they insist that they are entitled to first-class pilot licenses, because they have had second-class pilot licenses for one year. I do not think such persons competent to take charge of the deck of a steamer as first-class pilot, as they have had no practical experience. Neither do I think any steamboat owner or master would want to employ such a person to take charge of his steamer. They must serve one year (or eight months, which is the sailing season on the lakes) in charge of the deck with a first-class pilot before they are eligible to examination for first-class pilot's license. That is where they get their practical knowledge and experience. In answer to your other question, as to whether the holder of a second-class pilot's license can take charge of a watch on any of our large lake freight steamers, I refer you to sections 6 and 7, rule 5, of the Rules and Regulations, page 55, which reads as follows: 'Second-class pilot may be allowed to take charge of steamers not exceeding 100 tons burden, and may be authorized by the license granted to act in charge of a watch as assistant to a first-class pilot on freight and towing steamers of all tonnage.' "

It is certainly strange that, as stated in the foregoing correspondence, a rule of such importance should be adopted without discussion of any kind. Mr. Galvin says that the rule does not apply "to masters of sailing vessels navigating the lakes." But will it apply to the hundreds of them who are seeking advancement to steam vessels, and who may be turned down with an order to serve for a full season as second-class pilot on a steamboat. This would seem to be the only construction that can be placed upon the new rule. Local inspectors will certainly look upon it in that light, unless they have explicit instructions to the contrary, and as far as we can learn there has been no official interpretation of it otherwise. It would seem that the duty of inspectors in such cases as those to which Mr. Galvin would have the rule apply is fully covered in section 18, rule 5, of the regulations, and that there is really no cause for the rule on the grounds set forthin his communication. This question is certainly deserving of attention from the heads of the service and there should be a clear explanation of it at once.

Big Improvements at Dunkirk.

Major Thomas W. Symons, United States engineer at Buffalo, opened bids Monday, on a very large job of dredging and other harbor improvements at Dunkirk, for which provision in full is made in the sundry civil appropriation bill now before congress. As shown in the abstract of proposals printed herewith, this work will involve, including cost of supervision, an expenditure of about $400,000. Sullivan & Churchyard of Buffalo are the lowest bidders on all parts of the work.

Name and Address.	Channel and Harbor Excavation.	Repairs to West Pier.	Breakwater Channel Arm and Extension	Whole Work.
John B. Breymann, Toledo, O	$275,000	-------	--------	--------
Carkin, Stickney & Cram, Detroit	313,500	$19,540	$63,739.94	$396,779.94
W. J. Daly, Ogdensburg, N. Y	233,750	------	--------	--------
Edward J. Hingston, Buffalo, N. Y	231,000	28,184	60,102.85	319.286 85
L. P. & J. A. Smith Co. Cleveland, O	269,500	20,360	63,980.64	353,840.64
Sullivan & Churchyard, Buffalo, N.Y	225,500	17,596	57,324.44	300,420.44
Rider & Fitzgerald, Dunkirk, N. Y.	-------	19,756	--------	--------

Around the Lakes.

Samuel and Sidney Neff have purchasd the steamer A. E. Shores for $38,000.

L. H. Sullivan of Toledo bought the lumber barge Chicago Board of Trade at marshal sale in Port Huron, Monday, for $1,555.

Capt. Charles Carter, formerly a vessel owner and lately harbor master at Port Colborne, died at his home in that place recently. He was in his seventy-sixth year.

Wm. Empfield, who has made a great many friends among all vessel men who have had any business with the coal docks at Fair port, is a candidate for mayor of that place.

Ryan & Clarke of Buffalo will build a new elevator on the site of their old one which was burned recently. They are deliberating on the question of using steel instead of wood in the construction of the new house.

The Cuddy-Mullen Coal Co. of Cleveland is preparing to expend about $6,000 in improvements to the Watson and Anthony coal docks at Detour, which they have leased for the purpose of extending their vessel fueling business.

Capt. Daniel McLeod, who was for a great number of years engaged in publishing the Inland Lloyds Vessel Register, will engage in surveys and other insurance work in the future. He is located in the Perry-Payne building, Cleveland.

F. C. Goodman, a Cleveland real estate dealer, who is managing owner of the Keystone and Masten, has added by purchase the Wetmore and consort Brunette to his fleet. He is of the opinion that there is money in this class of vessel property and it is probable that he will increase his present fleet by other purchases.

Capt. B. B. Inman of Duluth, who was in Cleveland, Tuesday, says he has every assurance of the formation of a large company to build and operate several ice crushing steamers of the type which he proposes for winter service on the lakes. An illustration of the type of steamer patented for this service by Capt. Inman was published in a recent issue of the Review.

Notice of removal—The city ticket office of the Nickel Plate road in Cleveland will be removed April 1 from 224 Bank street to 189 Superior street. The West Side office at 534 Pearl street, will still be maintained. April 3-20

FIRST ROBIN ON THE RIVERS.

Detroit, Belle Isle & Windsor Ferry Co's steamer Promise going to St. Clair Flats from Detroit, Sunday, March 14, 1897.

Appointments of Captains and Engineers.

Blodgett, Wm. C., Buffalo: Steamer—St. Joseph, Capt. Fred A. Bradley, Engineer, J. A. Braman.

Recor, E. C., St. Clair, Mich.: Schooners—Porter, Capt N. McDonald; Golden Rule, Capt. C. W. Recor.

Jackson, G. K., Bay City, Mich.: Schooners—Celtic, Capt. Curtis Jackson; G. K. Jackson, Capt. Chas. K. Jackson.

H. J. Johnson, Cleveland: Steamer—H. J. Johnson, Capt. Charles Miner, Engineer John Seymore. Sail—Helvetia, Capt. Neil Murphy.

Corrigan, John, Cleveland: Steamers—Aurora, Capt. Robert Donaldson, Engineer James Cummings. Schooner—Aurania, Capt. William Dandy.

Port Huron & Washburn Line of Steamers, Port Huron, Mich.: Steamers—Colorado, Capt. Jno. McLean, Engineer ——; Osceola, Capt. Jno. McLeod.

Milwaukee Tug Boat Line, Milwaukee: Steamers—Helena, Capt. James Leisk; Neo ho, Capt. W. E. Wright; Veronica, Capt. O. J. Soleau. Sail—Amboy, Capt. W. R. Williams.

Northern Michigan Transportation Co.: Steamers—City of Charlevoix, Capt. Wm. Finucan, Engineer James W. Myers; Petoskey, Capt. Peter McGuiggan, Engineer Thomas Collins.

W. A. Hawgood, Cleveland: Steamers—L. R. Doty, Capt. Christopher Smith, Engineer T. Abernethy; Iosco, Capt. John Bradshaw, Engineer Geo. Smith. Schooner—Olive Jeannette, Capt. D. B. Cadotte.

American Transportation Co., Fairport, O: Steamers—Alex Nimick, Capt. D. P. Wright, Engineer E. J. Burns; Jno. Harper, Capt. Fred Graves, Engineer Edward Reilley. Sail—Tyrone, Capt. F. E. Johnson.

R. O. & A. B. Mackey, Hamilton, Ont.: Steamers—Sir S. L. Tilley, Capt. J. S. Moore, Engineer Jas. H. Brown; Lake Michigan, Capt. W. O. Zealand, Engineer Jos. Bolanger. Sail—T. R. Manett, Capt. Richard Freeman.

Fries, Valentine, Shinrock, O.: Steamer—Wm. Edwards, Capt. J. M. Johnston, Engineer Moses Blondin. Schooners—Golden Age, Capt. Daniel H. Stalker; M. W. Paige, Capt. Charles Hubbard; Charles Foster, Capt. John F. Higgie.

Lehigh Valley Transportation Co., Buffalo: Steamers—Saranac, Capt. James Todd; Tuscarora, Capt. Williams; Seneca, Capt. Driscoll; Wilbur, Capt. McFarlane. Officers of other vessels in this line undecided on account of uncertainty as to time of going into commission.

Williams, H. W., Transportation Co., South Haven, Mich.: Steamers—City of Kalamazoo, Capt. D. Morris, Engineer A. Krogman; H. W. Williams, Capt. J. Bayne, Engineer Perry Knaggs; Glenn, Capt. F. Swails, Engineer R. Peterson; Lorain L., Capt. A. C. Ingraham, Engineer P. Rubey.

Mitchell & Co., Cleveland: Steamers—Lagonda, Capt. Chas. Galton, Engineer M. F. Sauber; McWilliams, Capt. S. Stratton, Engineer Wm. Fetting; Gratwick (steel), Capt. M. P. Parsons, Engineer Henry Graves; W. F. Sauber, Capt. Harvey Stewart, Engineer ——; R. L. Fryer, Capt. B. D. Townsend, Engineer Gustav Guy; J. Mitchell, Capt. Richard Jackson, Engineer J. Wellhousen; Gratwick (wood), Capt. Fred. Galton, Engineer ——; Ed Smith, No. 1, Capt. C. D. Miller, Engineer ——; Ed Smith, No. 2, Capt. Hoyt Townsend, Engineer ——. Schooners—R. L. Fryer, Capt. Eli Jacques; S. E. Marvin, Capt. Wm. J. Brines; C. J. Fillmore, Capt. Englehart; Angus Smith, Capt. Henry Elbe.

Corning & Edgar, Saginaw, E. S., Mich.: Steamers—C. H. Green, Capt. Charles E. Little, Engineer John Lee; Oscoda, Capt. George W. Ryan, Engineer Robert Spear. Sail—Our Son, Capt. Peter Edgar; Genoa, Capt. Dan. C. Ryan; Ida Corning, Capt. Peter H. Edgar; C. G. King, Capt. Michael Ryan.

Corrigan, James, Cleveland: Steamers—Bulgaria, Capt. A. H. Gain, Engineer G. M. Newton; Caledonia, Capt. J. W. Brion, Engineer ——. Italia, Capt. C. H. Cummings, Engineer W. P. Treleaven. Schooners—Tasmania, Capt. John Sweeney; Northwest, Capt. Frank D. Perew; New steel vessel not named, Capt. Samuel E. Lewis.

Bielman, C. F., manager of river passenger steamers, Detroit: Steamers—City of Toledo, Capt. Geo. King, Engineer Wm. Dubois; Darius Cole, Capt. W. E. Comer, Engineer ——; Greyhound, Capt. B. C. Baker, Engineer Robert Medler; Arundel, Capt. Jno. Stover; Engineer Chas. McCarter; C. F. Bielman, Capt. Fred Stewart, Engineer ——.

Death of Harry Murphy.

Harry Murphy, assistant general manager of the Western Transit Co., whose death was announced a few days ago in the dispatches from Buffalo, was one of the most popular men connected with the several big line-boat organizations on the lakes. For several years past his duties were such as to involve all of the detail pertaining to affairs of the Western Transit Co. and his dealings with the large number of people who had business with that company were marked by strict integrity and devotion to his employers. Mr. Murphy was employed as a clerk in one of the New York railway offices twelve years ago when his ability attracted the attention of Stephen E. Caldwell, who was, up to a short time ago, general manager of the Western Transit Co. Mr. Caldwell took him to Buffalo as a stenographer. He was soon made private secretary to the general manager and later on he was advanced to the position of assistant general manager. In this latter capacity he was of invaluable service to the company, as his knowledge of the detail of the office and his retentive memory made him an encyclopedia of everything connected with the company's affairs. When G. L. Douglass became general manager of the line a few weeks ago Mr. Murphy was retained and proved a great aid to him in mastering all of the details of the immense business of the company. The thorough knowledge he had of the affairs of the corporation made Mr. Douglass feel at home and his assumption of the office was made easy. Mr. Douglass knew Mr. Murphy ever since the latter became connected with the line and feels his loss keenly. Death resulted from an operation performed at one of the hospitals at Buffalo. Mr. Murphy was taken ill about two weeks ago with what was thought to be stomach trouble, but it was not until a very short time before his death that the disease was pronounced to be appendicitis. An operation was ordered at once, and as it was successful it was thought that Mr. Murphy would recover but death came shortly after the operation.

General Passenger Agent Schantz of the Detroit & Cleveland Steam Navigation Co., who is always original in announcements regarding the passenger service of his company, has issued another unique card. A collection of clam shells on a counter are supposed to contain the several steamers of the line. Mr. Schantz appears with knife in hand opening one of the shells, in which there is a miniature representation of the city of Detroit, the first boat of the line, sailing off in water contained in one half of the shell.

After April 1 the Cleveland ticket office of the Nickel Plate road, at present located at 224 Bank street, will occupy 189 Superior street. The West Side ticket office at 534 Pearl street will be maintained as formerly. April 3-19

MARINE REVIEW

DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio, by John M. Mulrooney and F. M. Barton.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, $1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second class Mail Matter.

The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels	1,792	924,630.51
Sailing vessels and barges	1,125	354,327.60
Canal boats	416	45,109.47
Total	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1891	204	111,856 45
" " " 1892	169	45,968.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
" " " 1895	93	36,352.70
" " " 1896	117	108,782.38
Total	864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (*From Official Reports of Canal Officers.*)

	St. Mary's Falls Canal.			Suez Canal.		
	1895*	1894	1893	1895	1894	1893
No. vessel passages	17,956	14,491	11,008	3,434	3,352	3,341
Tonnage, net registered	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of navigation	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about ¼ per cent. of the whole, but largely in American vessels.

After a great many years of steady-going, systematic organization, the Western Transit Co. of Buffalo has encountered, within the past few months, a strange condition of affairs regarding its management. First came the retirement of Mr. S. D. Caldwell, who had been with the company during its years of greatest prosperity. Mr. G. L. Douglas of New York had hardly been appointed to succeed Mr. Caldwell, when Hugh McMillan of Chicago, who had also been with the company for a great number of years, and who was in charge, at Chicago, of the important affairs of the company at the western end of the line, met death accidentally while returning to duty after a short sojourn during the winter in California. And now comes the announcement from Buffalo of the death of Harry Murphy, assistant general manager of the company, who was also among the oldest officials of the line, and who was understood to be thoroughly conversant with its affairs. The Western Transit Co. is the lake line of the New York Central railway, and the largest of the steamship companies on the lakes that are operated in connection with the railroads. Putting aside his general knowledge of water transportation, gained in New York, Mr. Douglass takes up what would seem to be a new proposition in assuming the management of affairs of this company during the coming year. Those who know him say that he is equal to the situation.

Coal shipping firms of Cleveland, Toledo and other Ohio cities, who represent the principal companies producing bituminous coal in Ohio and Pennsylvania, and who ship about 4,000,000 tons of coal by lake each season, are against any increase of duty on coal in the new tariff bill. They have so notified representatives of the lake districts in congress. It is probable that they would, in fact, be opposed to duty of any kind on coal coming into this country, but they realize that the eastern coal trade must be considered in the matter. In a petition to congress, submitted through Congressman Burton of Ohio, the coal shippers say: "As producers and shippers of bituminous coal we are interested in whatever will broaden and extend the market for such coal, especially in the direction of exportation to the convenient and extensive market of Canada. There is at present a good prospect that the Canadian government will reduce its duty on bituminous coal if our government shall make no advance in its present duty. This would be certain to furnish a very much increased market for our coal in Canada, and be of great advantage to the producing districts of Ohio and Pennsylvania, from whence these export supplies would be drawn. We, therefore, respectfully urge that no advance be made in the duty on bituminous coal, or that a reciprocal provision be made that our rate of duty thereon shall not exceed Canadian rate of duty on the same article; and that in the event of a reduction of the duty by the Canadian government, our rate of duty shall be equalized with theirs."

One of the first bills introduced in the senate at the special session of the new congress was that of Senator Elkins of West Virginia, which provides for a discriminating duty of 10 per cent. on all goods imported into this country in vessels other than those of the United States. It also provides for the same duty on the importation of such goods by land means of transportation. The bill enforces the imposition of this discriminating duty on all goods in whatever way they may get into the United States if they shall have reached here in foreign vessels. Opposition to discriminating duties in the last congress does not seem to have shaken Mr. Elkins' faith in this method of assistance to American shipping, but it would seem that he will encounter as much opposition from Republicans in the new congress as was found among representatives of both of the leading parties when this bill was under consideration a few months ago.

A good illustration of the rapidity with which bureau chiefs at Washington bow to the rising sun is afforded by a new inscription just placed on one of the numerous models of battleships on exhibition in the main corridors of the state, war and navy building for the benefit of sightseers. Just outside of the door of the secretary of the navy there has been for a long time a model classified as "the Indiana and her class," meaning that she is the model of one of the three great battleships of which the Indiana is a type. The day that Secretary Long was sworn into office that label disappeared, and in its place there is a new one that reads: "The Massachusetts and her class." But the glass case contains the same old model. —New York Sun.

It is expected that Secretary Long of the navy department will issue advertisements in a few days, calling for bids for the construction of the three torpedo boats authorized by the recently enacted naval appropriation law. The bidders will not be restricted by departmental plans, the only requirements being that they shall furnish a boat that will produce a speed of 30 knots, carry a torpedo tube and two rapid-fire guns and have sufficient accommodations for a crew of moderate size. No European government is building small 30-knot boats, and Secretary Long, it is understood, will insist on a minimum displacement of about 200 tons.

As there was considerable complaint among vessel owners about shortages on six or seven vessels that delivered grain at Sandusky last fall, the firm of Rosenbaum Bros. of Chicago, who are now operating the B. & O. elevator at that point, have decided to give special attention to the weighing out of all grain in the elevator, which is to be removed entirely for a new crop, and it is understood that if this checking up of weights shows any excess of grain over previous figures, the over-run will be divided pro rata among vessel owners who were charged with shortages.

Capt. C. D. Sigsbee, who had been in charge of the Hydrographic office, Washington, since May, 1893, and who formed the acquaintance of a large number of vessel men on the lakes last season, while on a trip in the interest of the service, was relieved of duty in Washington on the 19th inst., and ordered to command the monitor Monadnock on the Pacific station. He has been succeeded by Commander J. E. Craig, who had been on duty at the New York navy yard. Capt. Sigsbee made a great many friends among vessel men during his connection with the Hydrographic office.

An advertisement from the Elk Rapids Iron Co., elsewhere in this issue, calls for bids on the transportation, during the coming season, of 4,500 tons of ore from Escanaba to Elk Rapids. The ore will be furnished so as to make up about six trips for a vessel carrying 750 tons, and will be unloaded without charge to the vessel.

Several naval officers who served with distinction during the war of the rebellion are honored in the selection of names for some of the new torpedo boats. Names selected for five of these vessels are Farragut, Porter, Dupont, Dahlgren and T. A. Craven.

Office of Commissioner of Navigation.

Two young men who have been at the head of treasury department bureaus under ex-President Cleveland have gained the confidence and admiration of the business interests of the country. One of these is Mr. Eckels, comptroller of the currency, who will undoubtedly command, if he desires it upon retiring from office, a high position with a remunerative salary from some one of the big eastern banking institutions. Rare ability was shown by Mr. Eckels during the exciting times of the past year when banks were failing in various parts of the country. The other young man is Mr. E. T. Chamberlain, commissioner of navigation, who adapted himself to the duties of that office immediately upon his appointment, although he had no special knowledge of navigation interests. In both of these cases the appointments were criticised on the ground that the men were not business men representing either the banking or navigation interests. But now there is a demand from these same interests that both of these officials be kept in office until their terms expire. Vessel owners in all parts of the country are certainly of this opinion as regards Mr. Chamberlain, whose term of office will not expire until next fall. Still there are a number of candidates for the office under the new administration, among them, ex-commissioner Bates, Mr. Kindt of Oregon, Capt. Smith of New York and perhaps ex-Congressman Farquhar of Buffalo, although he denies that he wants the place. Frank A. Flower of Wisconsin, whose candidacy was referred to in a communication in our last issue, sends the Review an interesting letter on the subject which was not intended for publication but which will probably do no harm if printed. He says:

"I have just received a copy of the Marine Review, which contains an exceedingly flattering communication based on the assumption that I am a candidate for commissioner of navigation. Endorsements like that of your correspondent will certainly cause me to believe that I am fit for the position. Since your kindness has gone so far, based upon an incomplete understanding of the situation, both, apparently, by yourself and your correspondent, who is so emphatic in my behalf, it seems proper to place you in possession of the truth.

"The idea of becoming a candidate had not entered my head. It did not originate with me. There seemed to be enough to do in private life. I had recommended that Commissioner Chamberlain be permitted to serve, if not his full four year term, at least long enough to complete his annual report, basing my judgment on this state of facts: The reports of custom officers on which the commissioner must rely for statistical information cover a period ending June on 30. Of course he cannot receive them until after that date. The new international code of rules and signals will go into operation in July next. Mr. Chamberlain had made a trip to Europe which resulted in reversing the rejection of the code by Great Britain, and I thought he ought to be permitted to officially announce the success of his mission and of the long negotiations required to bring about this much needed change. If a man knocks out Corbett or Fitzsimmons he will see the land fill with his fame through special editions of all the papers, in articles written by the greatest authors and politicians; but if, in an attempt to serve and benefit the endless stream of trade and commerce, he shall do nothing but knock out a nation, reset negotiations and reverse adverse judgments, scarcely a word is said about it. Knowing this, and also that Mr. Chamberlain had secured much legislation valuable to the marine interests, I thought it no more than right that he be permitted to serve long enough to prepare his final report fully and in the usual leisure, and so filed a recommendation, which was followed, if not preceded by others.

"Some New York marine interests had before begun a move in behalf of making me commissioner. It reached a stage when their spokesman came here to urge the appointment upon the administration, just then taking its seat. Immediately I put a stop to that, disclosing what my recommendation in relation to Mr. Chamberlain had been and saying also that I would almost as soon be seen assaulting my mother as joining the overriding stream that was wearing the life out of the president—fairly butchering him. It seemed to me that the onslaught, when it would be far better to write out and file applications accompanied by written indorsements, was outrageous and barbaric; and the New York man returned without any attempt to carry out his plan. He is a man high up in national affairs and a very strong friend of the president. Since then endorsements have been sent in, but not to the president or Secretary Gage, so far as I am aware. I think I have secured possession of all of them and locked them in my safe. They are excellent—far better than until recently I had supposed could be obtained. They cover ship building, transportation, engineering and marine interests from all parts of the country and really make me proud. If, bye and bye, it shall seem desirable for me to be a candidate for commissioner, these indorsements will be exhibited with the utmost pride."

Sarcasm from an Engineer.

I had never realized what an instrument of precision an ordinary glass gauge had to be until I read the following editorial comment in an engineering paper that I took when I was steamboating: "The water in a gauge glass is in effect a piston, whose areas equal the steam and water openings. If one of these last is inferior to the other, one end of the piston will have more pressure on it than the other, and the water in the glass will not show the water level in the boiler."

Says I, "I'll bet mine aint the same within the sixteenth of an inch. I wonder how much difference that would make anyhow?" If the top one is five-eights of an inch in diameter, the area would be .3068, and if the bottom one is eleven-sixteenths (one sixteenth bigger,) its area is .3712 of a square inch, and the difference would be .3712—.3068=.0644 of a square inch. As I carry 100 pounds to the square inch, the pressure on this area would be 6.44 pounds, and as one pound will support a column of water 27.71 inches high, then, under these conditions, my water line in the glass would be 27.71×6.44, or over 178 inches too high. My hair stood right up, and I sang out, "Jack, try those gauge-cocks, quick! If that editor is right, and my figures don't lie, our water level is somewhere down in the sewer" The gauge-cocks showed two gauges all right, and I made up my mind there could be no such difference in area. So I figured it over, assuming that the water opening was one-hundreth of an inch greater than the steam opening, and found that in that case the water would be over 27 inches too high. I shuddered when I thought how carelessly I had handled that gauge when I had it down—actually scraped out the connections with the end of a file. If I had happened to take one more scrape on the lower than I did on the upper hole, I might have changed the indication of that gauge 2 inches. I would like to know, Mr. Editor, if some of these boiler explosions, where there is "plenty of water," may not be accounted for by the area of the water connection being changed by a slight coating of scale; also, if there could not be a great saving effected in city waterworks by doing away with the pumps, sticking the end of the main right into the pond, and allowing the water to be forced into it by the difference in area of the pipe and the surface of the pond.—Marine Engineers' Directory, San Francisco.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, Mar. 20, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	10,538,000	7,718,000
Duluth	5,274,000	47,000
Milwaukee	246,000	3,000
Detroit	286,000	90,000
Toledo	946,000	2,007,000
Buffalo	990,000	112,000
	18,280,000	9,977,000

As compared with a week ago, the above figures show, at the several points named, a decrease of 242,000 bushels of wheat and an increase of 459,000 bushels of corn. Grain afloat at Chicago Mar. 20—Wheat 324,000 bushels, corn 3,814,000 bushels, oats 618,000 bushels, rye 194,000 bushels, barley 97,000 bushels; at Buffalo, wheat 200,000 bushels, corn 225,000 bushels, oats 81,000 bushels, rye 95,000 bushels; at Duluth, wheat 402,000 bushels.

Smooth roadway, quick time, perfect passenger service, uniformed train porters for the convenience of first and second-class patrons, through sleeping cars between Chicago, Buffalo, New York and Boston, unexcelled dining cars and no change of cars for any class of patrons between Chicago and New York city via the Nickel Plate road. 4 Mar 31

Take the Nickel Plate road to Boston. Through sleepers from Chicago. 2 Mar 31

Ship Yard Matters.

Two steel vessels, tow barges of a kind suited to the lower St. Lawrence trade, are to be built by the Canadian Locomotive & Engine Co. of Kignston for the Monrtreal Transportation Co., also of Kingston. Ship builders of Chicago, Cleveland and other cities in the United States submitted bids on these vessels, and Robert Logan, naval architect of Cleveland, has been consulted in matters pertaining to their construction, so that is probable that the Canadian owners were certain of their ability to secure Canadian register for them, if a contract was let here, but the order was finally placed with the Kingston firm. Mr. Alfred Smith of Cleveland will look after the interests of the owners in the building of the vessels. They will each be 179 feet long, 35 feet beam and 13 feet deep. The Canadian Locomotive & Engine Co. has no ship yard but they have a large water front and also an equipment of boiler shop tools that will serve for the building of these barges.

The first launch of the several steel tow barges that have been under way at the yards of the Chicago Ship Building Co. during the winter took place on Saturday last. The vessel is the Carrington, 386 feet long, 44 feet beam and 26 feet depth of hold. She is named for Mr. Carrington of the Chicago grain firm of Carrigton, Hannah & Co., who is interested in her, as well as in one or two other vessels built of late in Chicago. The Carrington will be owned by C. W. Elphicke and others and will be commanded by Capt. Geo. Trotter. She will tow behind the steamer Geo. N. Orr, which is also managed in the office of C. W. Elphicke & Co., Chicago. Although it seems only a short time since the Chicago Ship Building Co. was organized, this vessel is the twenty-sixth on the company's list of new ships. Such a record certainly speaks well for the management.

Capt. J. W. Martin.

Capt. J. W. Martin, marine superintednent for the Flint & Pere Marquette Ry. Co., who died at his home in Milwaukee on Sunday last, stood very high in the estimation of officers of the company with which he was employed. He had been instigative in increasing the business of the company on Lake Michigan, and with the completion of a big steel car ferry, the Pere Marquette, which was built mainly as a result of his efforts, he was in position to prove himself one of the most successful managers in this branch of the lake trade when death came very suddenly. His death was due to an attack of pneumonia, the result of a cold brought on through exposure while guarding the company's interests at Ludington during the recent strike of freight handlers. Capt. Martin was a native of Milwaukee, and but forty-one years of age at his death. When quite young he entered the marine service and was very favorably known at every port on Lake Michigan. He bought an interest in the steamer Roanoke and sailed her a number of years, and at one time was interested in a Chicago tug line. He was with the F. & P. M. Co. only four years, but had accomplished a great deal in the improvement of its lake lines during that short period.

E. M. McIlvain has been appointed general sales agent for the Bethlehem Iron Co., with headquarters at South Bethlehem, Pa. He was formerly assistant to the president and purchasing agent.

Trade Notes.

A new advertisement in this issue calls attention to the fact that the Bethlehem Iron Co., So. Bethlehem, Pa., is manufacturing sheared and universal ship plates. The reputation of this company in forgings and armor plate insures a product of the finest quality, and lake ship builders will do well to get their prices on material.

The Garlock Packing Co., Palmyra , N. Y., has established a branch at 117 Water street, Cleveland, to be in charge of H. W. Guthrie. This company's high pressure packing is coming into favor with the best lake engineers, and the establishment of a branch here, where all sizes and brands will be kept, is chiefly for the benefit of the marine trade.

A new steam pilot boat, the New York, designed by A. Carey Smith of New York, and to be owned by Sandy Hook pilots was launched at the ship yards of the Harlan & Hollingsworth Co., Wilmington, Del. The vessel is one of the finest of her kind in the country. She is equipped with a powerful wrecking and fire pump of the Blake vertical "Admiralty" pattern.

In a letter of recent date the correspondent of the Lake Marine News Association at Sault Ste. Marie says: "Weather during the first of March was very severe, adding a great deal to the thickness of the ice, as well as to the snow fall, but the last two or three days have been mild with some rain. In Mud lake there is about 20 inches of ice with about 4 inches of water over it, which, with the snow, makes over a foot of slush. Should we get a few days of freezing weather, turning this slush into ice, the opening of navigation would be greatly delayed. On the other hand, should mild weather prevail from this out this slush over the ice would tend to hasten the opening. These conditions also exist in Hay lake to such an extent that the ice roads are impassable for teams. At the "Soo" there is 18 inches of solid blue ice and about 20 inches of snow."

WANTED

BIDS by April 1st, for CARRYING 4,500 Tons Ore, Escanaba to Elk Rapids. About 750 tons per trip. Free out. Yours truly,

ELK RAPIDS IRON CO.,
Elk Rapids, Mich.

The Bessemer Steamship Company

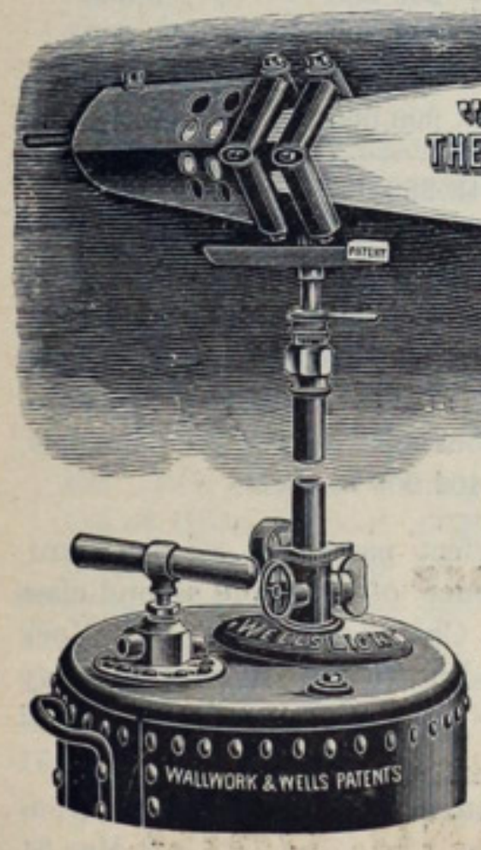
Solicits Catalogues, Prices and Discounts from manufacturers and wholesale dealers in Ship Machinery, Brass Goods, Rope, Paints, Oils, Asbestos, Packing, Hose, Furniture, Piping, Glass and Crockery, Tinware, Ranges, Carpeting, Bedding, Life-preservers, Rafts and Boats, Engineers' Supplies and Tools, Carpenters' Tools, Electric Supplies, Lamps, Grate Bars, Castings, etc., etc., etc.

ALSO QUOTATIONS from Market men and Grocers on the Lakes for Provisions and Meat, best quality only.

CATALOGUES without quotations are not wanted.

ALL GOODS except provisions to be delivered in Cleveland.

Address L. M. BOWERS, General Manager,
CLEVELAND, OHIO.



10,000 IN USE.

Unaffected by Weather.

Portable, Self Contained.

800 to 4000 Candle Power from KEROSENE OIL.

Especially adapted for Contractors, Quarries, Shovels, Railroad Construction, Dredges, Bridge and Dock Builders, Water-Works, Brick Yards and Coal Docks.

400 RAILROADS and over **300** CONTRACTORS now use the WELLS LIGHT.

The Wells Light Mfg. Co.

EDWARD ROBINSON, Sole Proprietor.

46 Washington Street, NEW YORK.

Chas. E. & W. F. Peck,

58 William St.,
NEW YORK CITY.

812 Royal Insurance Building,
CHICAGO, ILL.

C. T. BOWRING & CO.,

5 & 6 Billiter Ave., E. C.,
LONDON, ENG.

INSURANCE.

BROWN & CO.,
202 Main St.,
BUFFALO, N. Y.

J. G. KEITH & CO.,
138 Rialto Bldg.,
CHICAGO, ILL.

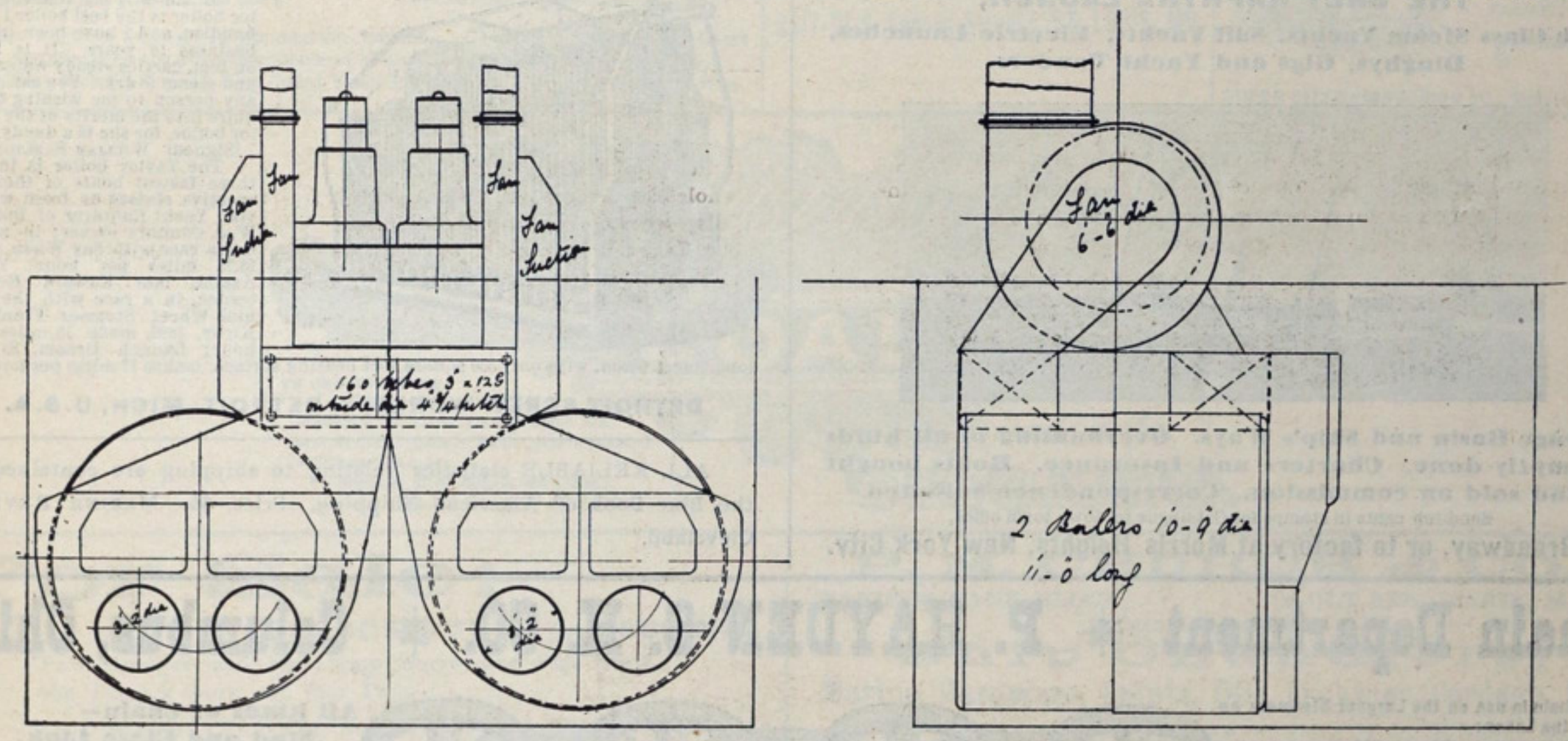
LA SALLE & CO.,
Board of Trade Bldg.,
DULUTH, MINN.

Are prepared to make rates on all classes of Marine Insurance on the great lakes, both CARGOES and HULLS.

"Great Lakes Register."

F. D. HERRIMAN, Surveyor-General, Chicago, Ill.

The Ellis & Eaves Induced Draft---Serve Ribbed Tubes



DRAWING SHOWING PLAN FOR ADDING THE ELLIS & EAVES DRAFT TO LAKE STEAMERS.

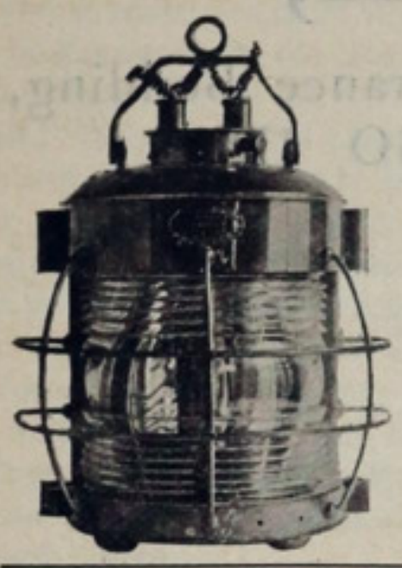
THIS SYSTEM OF DRAFT, WITH THE SERVE TUBES, SAVES MONEY.

S A V E S	25 PER CENT OF YOUR FUEL BILLS.
A $ $ $ A	40 to 50 PER CENT BOILER CAPACITY.
V $ $ $ V	THE LIFE OF THE BOILER BY DRAWING GASES THROUGH TUBES.
E $ $ $ E	FIREMEN AND INCIDENTALLY THEIR WAGES.
S A V E S	CARGO SPACE BY USING A SMALLER NUMBER OF BOILERS.

For PARTICULARS and PRICES of applying to Steamers already Built and to Steamers Building, apply to

THE GLOBE IRON WORKS COMPANY, CLEVELAND, OHIO.

MARINE LAMPS



Oil and Electric Equipment for Steamships, Yachts, etc.

Signal Lights, Saloon Fixtures, Cabin Lamps, Lanterns, etc.

Wm. Porter's Sons,

271 Pearl St., NEW YORK CITY.

INCORPORATED 1794.

Insurance Company of North America

CAPITAL, Paid up in Cash, - - $3,000,000.00
ASSETS, . - - - - - - - - 9,651,808.08

CHARLES PLATT, President. GEO. H. McFADDEN, Vice-President
EUGENE L. ELLISON, 2nd Vice-President. GREVILLE E. FRYER, Sec'y. & Treas.
JOHN H. ATWOOD, Assistant Secretary.

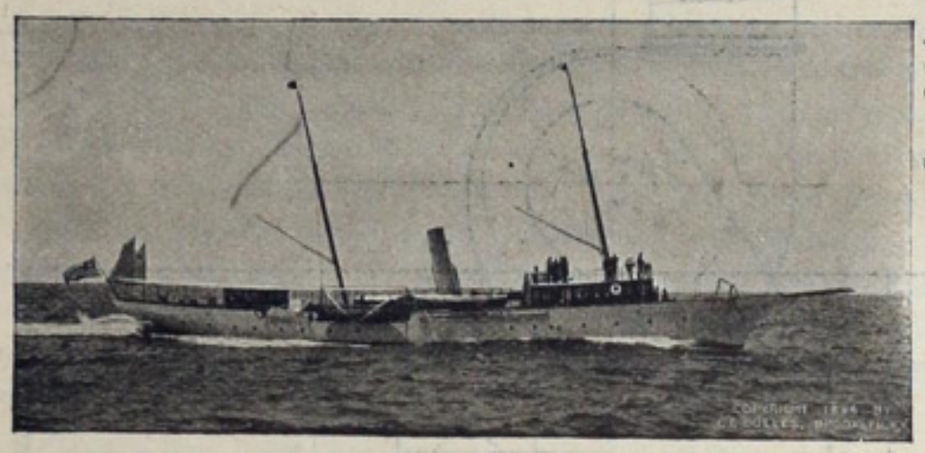
Lake Marine Department.

GEORGE L. McCURDY, Manager.
CHICAGO, ILLS.

Gas Engine & Power Co. and Charles L. Seabury & Co.

Seabury's Water Tube Boilers and Marine Engines.

BUILDERS OF
THE ONLY NAPHTHA LAUNCH,
High Class Steam Yachts, Sail Yachts, Electric Launches, Dinghys, Gigs and Yacht Tenders.



Storage Basin and Ship's Ways. Overhauling of all kinds promptly done. Charters and Insurance. Boats bought and sold on commission. Correspondence Solicited.

Send ten cents in stamps for Catalogue to down town office,

50 Broadway, or to factory at Morris Heights, New York City.

G. H. FOSTER, Prest. MARK H. HANLON, V.-Prest. & Secy. W. H. WARNER, Treas.
DAVID BARNHISEL, Gen'l Mgr.

The Inter-Ocean Coal & Coke Co.

General office, 513 Perry-Payne Bldg., Cleveland.

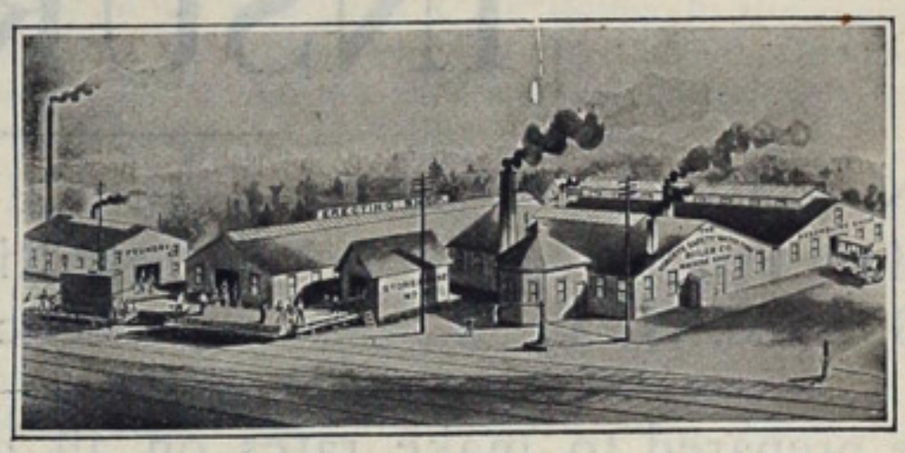
PRODUCERS AND SHIPPERS.

Choicest Grades of YIOUGHIOGHENY COAL

FOR STEAMBOAT FUEL.

Lighter in Cleveland Harbor of 400 tons capacity.

CLEVELAND DOCKS, just north of Main Street bridge.
SAULT RIVER DOCK, just above Detour, known as Watson dock



Office of AMERICAN STEEL BARGE Co.

West Superior Wis., Oct. 31, 1895.

The Roberts Safety Water-Tube Boiler Co., 39 and 41 Cortlandt St., New York.

Gentlemen: Replying to yours of the 28th I am glad to say that the boiler you furnished us for tug "ISLAY" is giving entire satisfaction. I have heard no complaint about it whatever, but have heard a good deal in its favor. I ride on the boat frequently and must say that I am much pleased with its work. Very Truly yours, Alexander McDougall, General Manager.

THE ROBERTS BOILER is the Cheapest, Best and Lasts Longest.

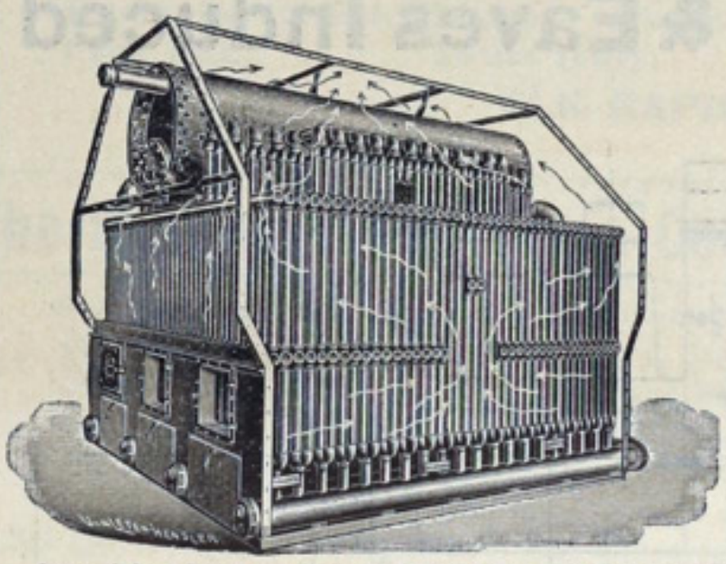
Adapted for use in Yachts, Launches, and Vessels of all Kinds.

Handsome Illustrated Circular sent free on application to

The Roberts Safety Water Tube Boiler Co.,

WORKS, RED BANK, N. J. 39 & 41 Cortlandt St., NEW YORK.

TAYLOR PATENT UPRIGHT WATER TUBE BOILER.



Chief Engineer Skelton of Steam Yacht Enquirer writes: "I can honestly say, that the Taylor boiler is the best boiler I ever handled, and I have been in the business 18 years. It is light on fuel, carries steady water line and steam is dry. You can refer any person to me wishing to inquire into the merits of the Taylor boilor, for she is a daudy."

(Signed) WILLIAM SKELTON, Jr.

The Taylor boiler is in the three fastest boats of their respective classes on fresh water, viz., Yacht Enquirer of Buffalo, W. J. Connors owner; in a 29¼ miles race with Say When made 18.78 miles per hour; Yacht Azalia, late Edward Henkel owner, in a race with the fast Side-Wheel Steamer Frank E. Kirby, 1896, made 18 miles per hour; Launch Dream, 63 feet long, 9 feet beam, with only 350 square feet heating surface, makes 17 miles per hour.

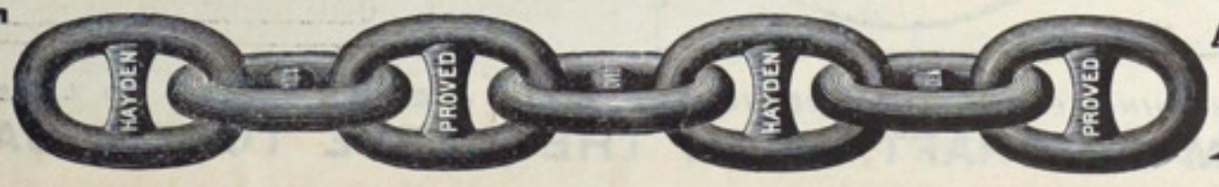
MANUFACTURED BY

DETROIT SCREW WORKS, DETROIT, MICH, U.S.A.

ALL RELIABLE statistics relating to shipping are contained in the Blue Book of American Shipping. Price, $5. MARINE REVIEW, Cleveland.

Chain Department ✻ P. HAYDEN S. H. CO. ✻ Columbus, Ohio.

Our Chain in use on the Largest Steamers on the Lakes:
The Zenith City, Victory, North West and North Land, and many others.



All kinds of Chain—Stud and Close Link, Cable Chains. Write for Prices.

PRATT & WHITNEY CO., Hartford, Conn.

Machinery and Tools for Marine Engine Shop Equipments.

Small Tools. *Stay-Bolt and Stay-Tube Taps a Specialty.* *Standard Gauges and Reamers.*

NEW YORK, 123 LIBERTY ST. CHICAGO, 42 AND 44 SO. CLINTON ST. BOSTON, 281 FRANKLIN ST.

THE ELECTRO DYNAMIC CO.,

224 Chestnut St., Philadelphia.

Electrical Engineers and Mfrs. of Electrical Machinery,

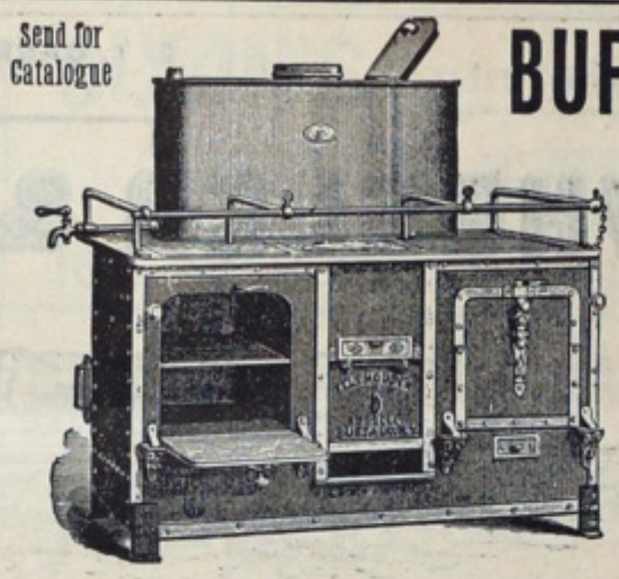
Marine Generating Sets for Supplying Light or Power.

COMPLETE ELECTRICAL MARINE EQUIPMENTS.

Portable Electric Drill Motors now in use at

Cramp & Son's Ship and Engine Building Co.,
Newport News Ship Building and Dry Dock Co.,
Crescent Shipyard.
Union Iron Works,
Brooklyn Navy Yard and
International Navigation Co.

Send for Catalogue

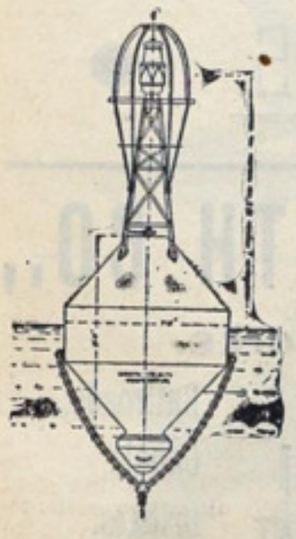


BUFFALO WROUGHT STEEL RANGES

Steamboat and Vessel Ranges and Boilers, with patent Rotary Grate.

SOMETHING NEW AND GOOD.
We also carry the STAMFORD TUG AND YACHT GALLEY STOVES.

RUSSELL & WATSON
Successors to Felthousen & Russell.
145 Main St., BUFFALO, N.Y.



PINTSCH GAS LIGHTED BUOYS

Adopted by the English, German, French, Russian, Italian, and United States Light House Departments, for Channel and Harbor Lighting; over 500 gas buoys and gas beacons in service.

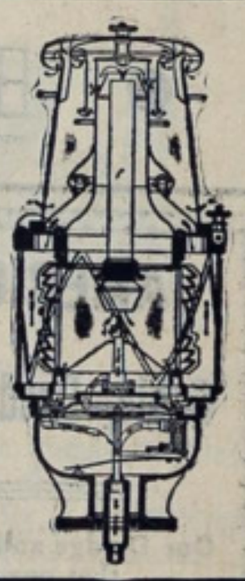
BURN CONTINUOUSLY from 80 to 365 days and nights without attention, and can be seen a distance of six miles.

Brilliant and Steady Illumination. Economical and Reliable in Operation.

CONTROLLED BY THE

Safety Car Heating & Lighting Company,

160 BROADWAY, NEW YORK CITY.



WILLIAM WILFORD'S MATCHLESS WATERPROOF CLOTH Trade Mark.

WM. WILFORD'S
Matchless Water-Proof Canvas.

The best in the market for Hatch Covers, is stronger lighter and more durable than any Water-Proof Goods yet produced. It is made of a twisted thread of pure flax which renders it very strong. It will not crack like Cotton Goods or take fire as easily, which is a great advantage, if soft coal is used.

EDWARD A. BUNKER,
Room 617, 27 & 29 WILLIAM ST., NEW YORK.

JOHN HAUG,

Consulting Engineer and Naval Architect.

Ship and Engineer Surveyor Lloyds Register, London.
Plans, Specifications and Superintendence of Ships and their Machinery.
Specialties—Bulk Oil Vessels High Speed Yacht Engines, etc.

206 Walnut Place, Philadelphia.

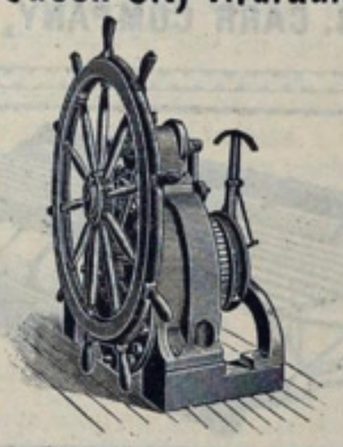
American Boat Building Co. Incorporated.

35x7 foot Launch Frame.

Knock-Down Boats, something new. We do the work, you nail together. Freight low, prices reasonable. Also completed Boats, Half-Raters. Knock-Abouts and Canoes. Send stamp for catalogue.

3517-21 S. Second Street, ST. LOUIS, MO.

Queen City Hydraulic Steerer.



Best and Most Powerful Steerer

FOR TUGS, STEAMERS, ETC.

Price—From $650 to $750, according to size and location in steamer.

Manufactured by

QUEEN CITY ENGINEERING CO., Buffalo, N.Y.

C. S. Richardson Fueling Co.

COAL

FUELING DOCKS:
NORTH PIER,
18TH STREET BRIDGE,
ILLINOIS CENTRAL SLIP "C."

STORAGE DOCKS FOR ANTHRACITE:
KINGSBURY ST. BETWEEN INDIANA & ERIE STS.
ELSTON AVE. DIVISION ST. BRIDGE, (NORTH BRANCH.)
NORTH AVE. BRIDGE.
DIVISION ST. BRIDGE, (OGDEN CANAL.)
SOUTH HALSTED ST. BRIDGE.

OFFICE, 225 DEARBORN ST.
CHICAGO.

For Sale:

DREDGES, TUGS and SCOWS.

Two Dredges and six Dump Scows, one Flat Scow, one Derrick Scow and four Tugs—

One with	15	by	17	engine, allowed	110	lbs. steam.
" "	17	by	16	" "	110	" "
" "	20	by	22	" "	125	" "
" "	20	by	24	" "	110	" "

Inquiries from parties who mean business cheerfully answered.

JAMES ROONEY, 1118 Collingwood Av., Toledo, O.

P. M. CHURCH & CO.,

SAVINGS BANK BLOCK, SAULT STE. MARIE, MICH

LEADING DEALERS IN

Ship Chandlery,

Marine Hardware, Paints, Oils, Packings, Cordage, Etc.

FIRST-CLASS COPPERSMITH AND TINSHOP IN CONNECTION.

J. H. PARSONS CHEMICAL CO. TRADE A·B·C MARK CHICAGO, ILL.

ALKALI WATER PURIFIER!

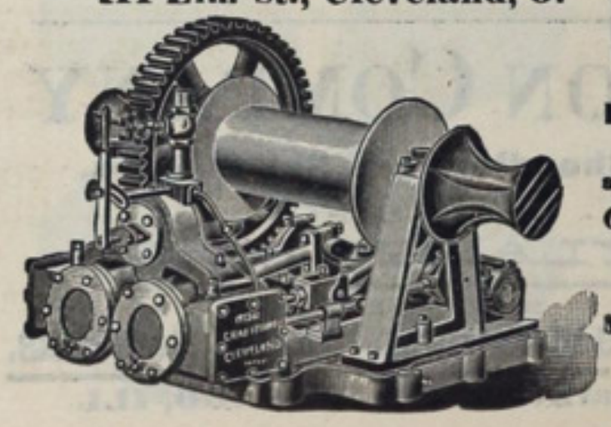
A Pure Chemical for the safe Removal and Prevention of Scale in Steam Boilers. In use by many of the larger steamship lines on the great Lakes. Guaranteed.

MANUFACTURED BY

THE J. H. PARSONS CHEMICAL CO.,
1509 Masonic Temple, CHICAGO, ILL.

The Chase Machine Co.

111 Elm St., Cleveland, O.



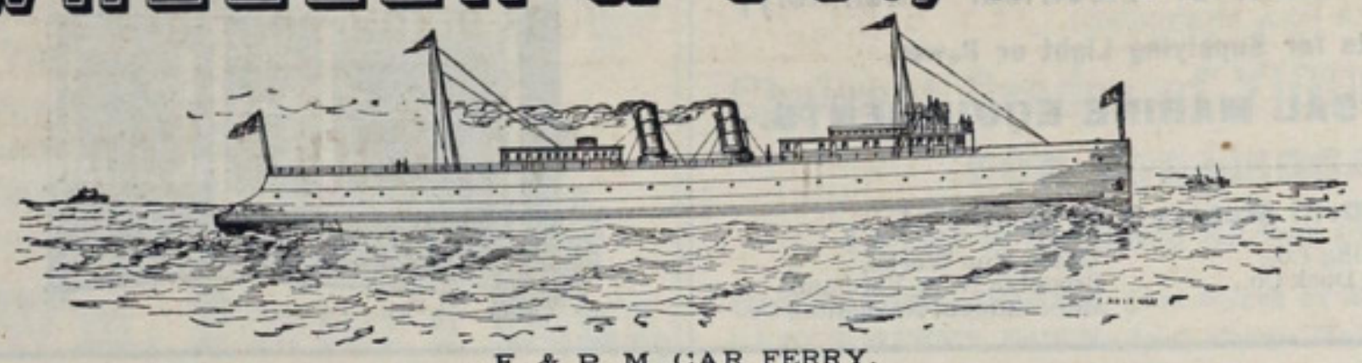
MACHINISTS and ENGINEERS

MANUFACTURERS OF
Land and Marine Engines and Steam Pumps,

SOLE OWNERS AND MANUFCTURERS OF
Chase Fog Whistle Machine.
Over 150 in use on the best class of Lake Steamers.
Special Attention given to
MARINE REPAIR WORK.
Engineers' Supplies.
Asbestos Pipe and Boiler Covering.
TELEPHONE 994.

F. W. WHEELER, President. E. T. CARRINGTON, Vice-President. C. W. STIVER, Secy. and Treas.

F. W. WHEELER & CO., West Bay City, Mich.



F. & P. M. CAR FERRY.

Builders of all kinds of METAL AND WOODEN SHIPS.

AMERICAN CHAIN CABLE WORKS.

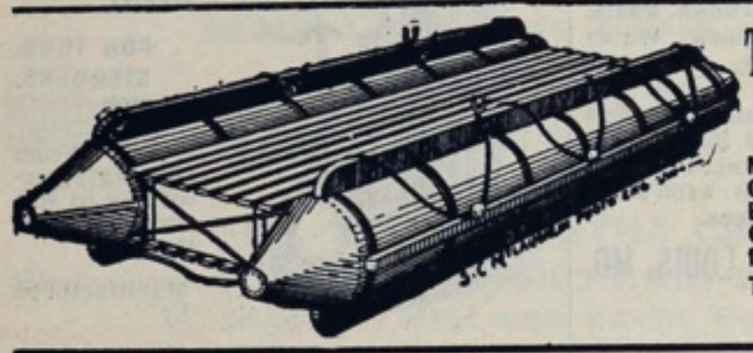
ESTABLISHED 1865.

Cable, Dredge, Quarry, Shipping, Crane and Rafting

CHAINS.

Our Dredge and Crane Chains are made of Iron Rolled Specially for that purpose in three qualities, "Burden's," "H. B. & I." iron, and "Burden's Best Best" iron.

THE J. B. CARR COMPANY, TROY, NEW YORK.

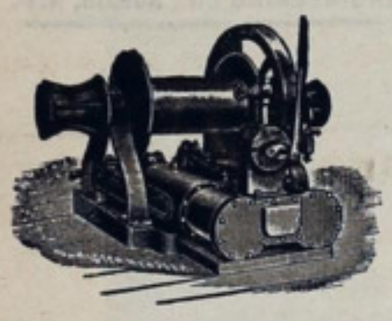


Thos. Drein & Son,

BUILDERS OF

Metallic Life Boats and Rafts, Government and Pleasure Boats. Block and Granulated Cork Life Preservers. Outfit for Lake Steamers a Specialty.

TATNALL & RAILROAD STS. Wilmington, Del.



DOCK and DECK HOISTS

ALL KINDS OF

Machinery & Friction Hoists.

SEND FOR PRICES AND CIRCULARS.

JACKSON & CHURCH, SAGINAW, MICH.

THE RESORT OF YACHTSMEN.

for a quarter of a century has disappeared from view, but the STOCK OF FITTINGS that attracted them still lives in other and larger quarters. We should be pleased to see all our old friends in our new location, and will guarantee to show the LARGEST variety and make the LOWEST prices on record on YACHT AND BOAT HARDWARE.

No new catalogue this year, but ten cents in stamps will bring one of last year's with its 237 illustrated pages to your door. Let us hear from you.

L. W. FERDINAND & CO., 176-184 Federal St., Boston, Mass.

HOWARD H. BAKER & CO.

Ship Chandlers and Sail Makers,

18 to 26 Terrace. BUFFALO, N.Y.

H. CHANNON COMPANY

Ship Chandlers and Sail Makers.

AGENTS FOR

RYLANDS BROS.

MANUFACTURERS OF

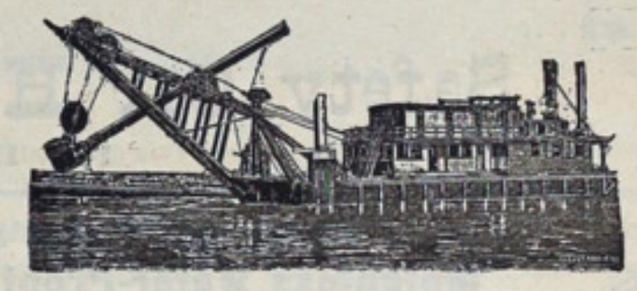
ENGLISH GALVANIZED STEEL HAWSERS,

24-26 Market Street, CHICAGO, ILL

THE L. P. & J. A. SMITH CO.,

Contractors of Public Works.

Dredging, Pile-Driving, Breakwaters, Dry Docks and Pier Building,



Railroads, Canals, Bridges, Foundations, Etc., etc.

23 River St., CLEVELAND, O.

H. E. STEVENS. TOM MEAD. LEW PRESLEY

BUCKEYE STEAM FITTING CO.

Steam Fitters, Engineers Supplies,

Phone 4058. AGENTS FOR

RAINBOW PACKING.

Open Day and Night. 117 River St., CLEVELAND, O.

The Martin-Barriss Co.

IMPORTERS AND MANUFACTURERS OF

Mahogany, White Mahogany,

AND ALL NATIVE CABINET WOODS.

HIGH GRADES OF KILN DRIED WOODS FOR CABIN WORK AND INSIDE TRIM.

White Oak Timbers and Plank

CONSTANTLY ON HAND AND SAWED TO ORDER ON SHORT NOTICE.

654 Seneca Street, Cleveland, Ohio.

DETROIT SHEET METAL AND BRASS WORKS

No. 64-66-68-70-72 ORLEANS STREET, DETROIT, MICH.

Jobbers of..... Pipe, Valves, Fittings. Packing, Oil and Engineers Suplies.

Contractors for High Class Steam Fitting, Steam Heating, Plumbing, Copper Work, and all Classes of Sheet Metal Work.

Manufacturers of Clark's Patent Metallic Life Raft, Side Lights, Marine Hardware, Hurricane, Cabin and Platform Lamps, Trip Gongs, etc.

Agents for..... Laidlaw - Dunn - Gordon Steam Pumps, Warren Webster's Specialties, and Buffalo Forge Co.'s Fans, Engines and Heaters.

Engineers can be waited on promptly day or night.

DIXON'S Graphite Pipe Joint Compound

Enables you to MAKE A TIGHTER JOINT than you can possibly make with red lead. You can do it easier, and parts can be separated at any time without breaking anything. Send for sample and circular.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

DIXON'S Lubricating Graphite

Is fully explained in an INTERESTING AND INSTRUCTIVE PAMPHLET which is FREE to all interested. It will pay all Engineers and Machinists to SEND FOR IT.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

Fred'k Baldt, President. W. M. Gelston, Vice-President.
W. S. Bickley, Sec'y and Treas.

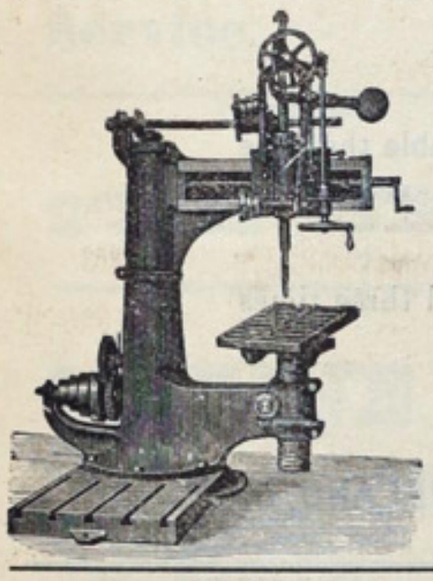
Baldt Patent Stockless Anchor.

Made of the finest quality of open-hearth steel and constructed on the ball and socket principle.

Many points of superiority over ordinary Stockless Anchors.

BALDT ANCHOR COMPANY,
CHESTER, PA.

WALTER MILLER, Western Reserve Bldg., Cleveland, Ohio,
Representative for the Great Lakes.



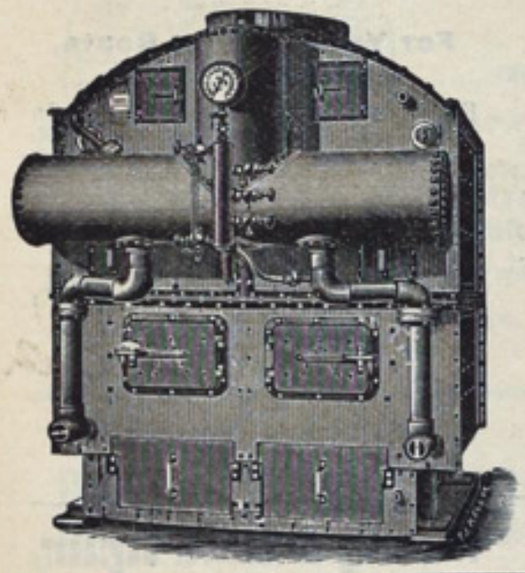
Bement, Miles & Company,

PHILADELPHIA, PA.
MANUFACTURERS OF
Metal Working Machine Tools

For Ship Yards, Railroad Shops, Locomotive and Car Builders, Machine Shops, Rolling Mills, Steam Forges, Boiler Shops, Bridge Works, etc., etc.

Steam Hammers, Steam and Hydraulic Riveting Machines.

New York Office: Taylor Bldg. No. 39 Cortlandt St.
Chicago Office: 1534 Marquette Building.



ALMY'S PATENT
SECTIONAL
Water-Tube-Boilers.

NOW USED IN
18 Passenger Boats from 70 to 160 feet long.
27 Steam Yachts from 50 to 160 feet long.
U. S. Torpedo Boat "Stiletto."
Numerous Small Launches and Stationary Boilers are giving most excellent results.

ALMY WATER-TUBE BOILER CO.,
No. 178-184 Allens Avenue,
near Rhodes St.
PROVIDENCE, R. I.

For Stationary, Portable, Traction Engines, Tugboats, &c.
Thoroughly Reliable—Perfectly Automatic.
JENKINS BROS., - Selling Agents,
NEW YORK, BOSTON, PHILA., CHICAGO.

VANDUZEN Steam JET PUMPS

THE BEST IN THE WORLD.
Pumps any kind of Liquid. Always in order. Never clogs nor freezes. Fully Guaranteed. COST $7 AND UPWARD. Especially useful for Mines, Quarries, Pits, Wells, Clay Pits, Breweries, on Steamships, Ferryboats, Sugar Plantations, etc. A full stock always on hand.

Descriptive Catalogue and Prices furnished Free. **THE E. W. VAN DUZEN CO.,**
Cincinnati, O.

FRANKLIN HOUSE

ESTABLISHED 1837.
Cor. Bates and Larned Sts.,
DETROIT, MICH.

Only a Block from Woodward & Jefferson Aves. Very Central Near All Car Lines.

Per Day, $1.50. **H. H. JAMES, Prop.**

Paint your Vessels with **Superior Graphite Paint.**

NO BLISTERING, CRACKING OR SCALING.
Made especially for Stacks, Decks, Sides, Hulls and Water Compartments. Strictly anti-rust, and most durable and economical.

DETROIT GRAPHITE MFG. CO., 541 River St., Detroit, Mich.

Chas. Corv & Son

Manufacturers of the
Mechanical and Electric Marine Telegraph,

Electrical Helm Indicators
Electric Call Bells.

Engine Bells and Brass Work of all descriptions, Shrieking and Siren Whistles.

278 DIVISION ST.,
NEW YORK CITY.

Alfred B. Sands & Son

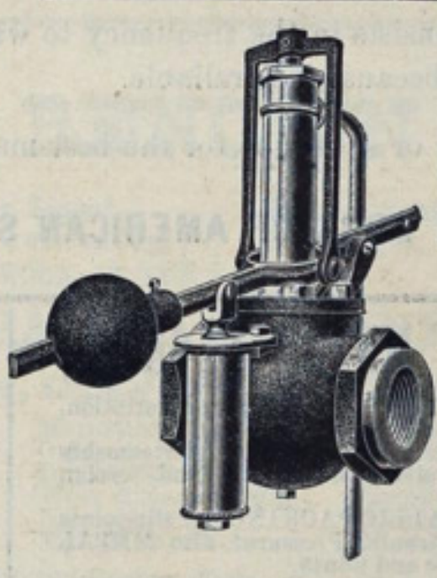
YACHT PLUMBERS,
AND MANUFACTURERS OF
YACHT PLUMBING SPECIALTIES.

Patent applied for.

The only pump water closet in the world so constructed as to be positively free from danger of flooding.

Folding Lavatories, Pumps, Ventilators, Etc., Etc.

134 Beekman St., NEW YORK.



The "DAVIS" Pressure Regulator and Reducing Valve.

Is the simplest and best for reducing the pressure to Steam Steering Engines, Donkey Engines, Steam Winches and all places requiring a uniform pressure below that of boilers.

No diaphragms, spring or packing.

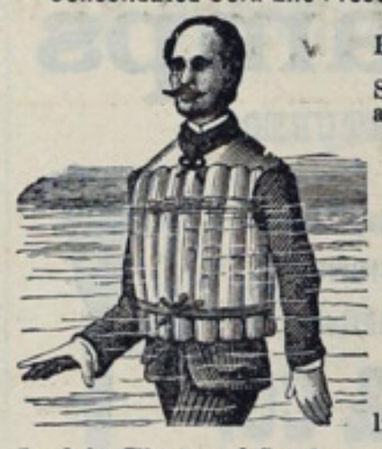
Cut shows ball weight. We can furnish scale weights if preferred.

MANUFACTURED BY
G. M. DAVIS & CO.
106 N. Clinton St., CHICAGO, ILL.
FOR SALE BY
R. E. Hills, Chicago. C. H. McCutcheon, Buffalo
Geo. Worthington Co., Cleveland.
P. M. Church, Sault Ste. Marie. Jas. Walker & Son, Detroit
Jas. Clements & Son, Bay City, Mich.
Cleveland Ship Building Co., Cleveland.
Chicago Ship Building Co., Chicago.

Selling agents—The McIntosh-Huntington Co., Cleveland, O.; The Detroit Sheet Metal and Brass Works, Detroit, Mich.

NEVERSINK CORK JACKET AND LIFE BELT.

Warranted 24 lb. Buoyancy and full Weight of Cork, as required by U. S. Inspectors.
Consolidated Cork Life Preservers. Superior to all others. **Ring Buoys and Fenders.**

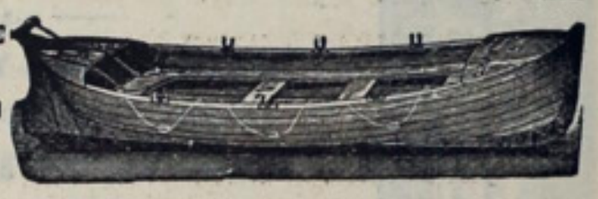


SAFEST, CHEAPEST. Approved and adopted by U. S. Board of Supervising Inspectors.

Also adopted by the principal Ocean, Lake and River Steamer Lines as the only Reliable Life Preserver. Vessels and the trade supplied. Send for catalogue.

Awarded four Medals by World's Columbian Exposition

Metallic and Wooden Life Boats.



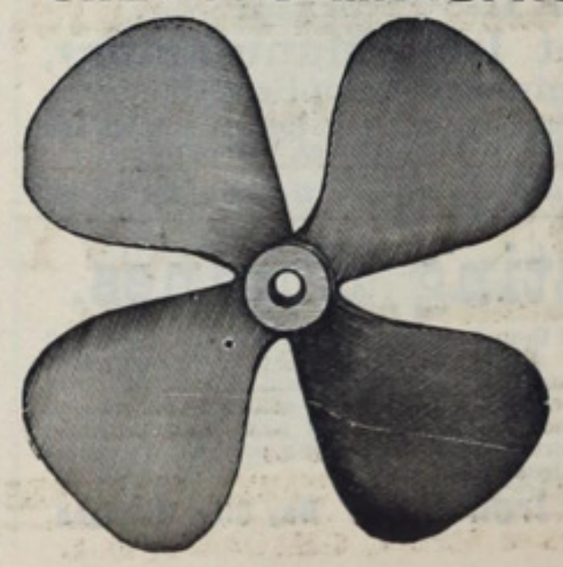
Metallic Life Rafts, Marine Drags.

Manufacturer of Woolsey's Patent Life Buoy, which is the lightest, cheapest and most compact Life Raft known.

Send for Illustrated Catalogue.
Get our prices before buying elsewhere.

D. KAHNWEILER,
437 Pearl Street, NEW YORK CITY.

SHERIFFS MANUFACTURING COMPANY,



Manufacturers of
Propeller Wheels.

MARINE ENGINES AND REPAIRS.

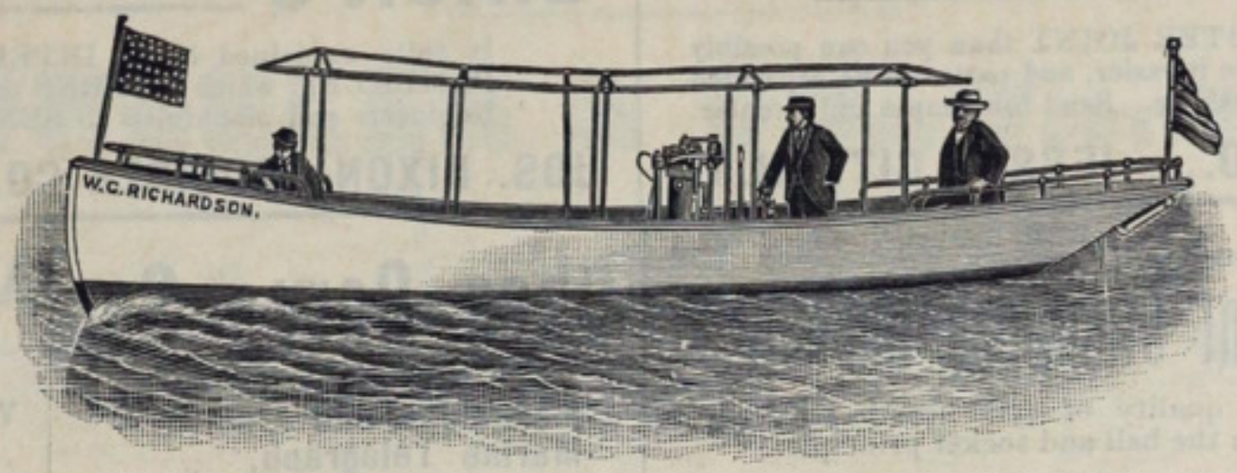
Milwaukee, Wis.
TELEPHONE S.—163.

The Wootters Gas Engine.

Especially adapted for launches and ferry boats. Fitted with friction clutch or reversible shaft.

These engines are giving entire satisfaction in the pleasure yacht W. C. Richardson and the delivery launch Lotta.

Prices and particulars furnished on application.



Suitable for all purposes requiring from 1 to 200 horse-power, with the lowest possible expenditure.

Engines of the stationary type built for every purpose where a reliable and efficient power is required.

NAPHTHA LAUNCH W. C. RICHARDSON, (Engine 8 horse power—speed 8 miles an hour.)

BUILT BY THE . . . . . McMYLER MFG. CO., GAS ENGINE DEPARTMENT, 180 Columbus St., CLEVELAND, O.

1897—Blue Book of American Shipping—1897

"IT IS BETTER TO BOAST AFTER THE BATTLE."

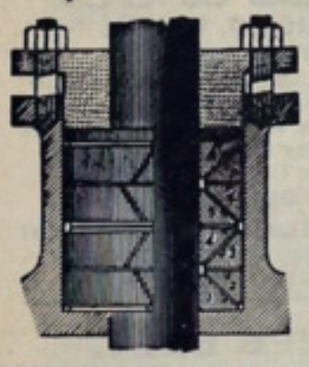
The publishers of the 1897 Blue Book are using their energy to make the 1897 Blue Book more valuable than the 1896 Blue Book. Last year we promised to get out a book that would be satisfactory. The result exceeded all expectation and was pronounced far superior to any lake directory ever published.

The value of a directory consists in the frequency to which it is referred to. The Blue Book is used three times to one, more than any other—because it is reliable.

If you want to advertise in or subscribe for the best marine directory ever published, write, at once,

BLUE BOOK OF AMERICAN SHIPPING, 409 Perry-Payne Bldg., CLEVELAND, O.

KATZENSTEIN'S Self-Acting METAL PACKING,



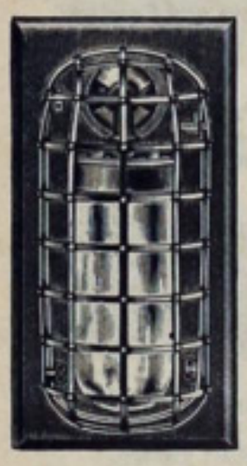
For PISTON RODS, VALVE STEMS, etc., of every description, for Steam Engines, Pumps, etc., etc.

Adopted and in use by the principal Iron Works and Steamship Companies, within the last twelve years, in this and foreign countries.

FLEXIBLE TUBULAR METALLIC PACKING, for slip-joints on Steam Pipes, and for Hydraulic Pressure; also METAL GASKETS for all kinds of flanges and joints.

DOUBLE-ACTING BALANCED WATER-TIGHT BULKHEAD DOORS for Steamers. Also Agents for the McColl-Cumming PATENT LIQUID RUDDER BRAKE. For full particulars and reference, address:

L. KATZENSTEIN & CO.,
General Machinists, Brass Finishers, Engineers' Supplies,
357 West St., New York.



Ship Lamps

OIL AND ELECTRIC FIXTURERS

— FOR —

Steamships, Yachts, &c.

GREAT VARIETY OF DESIGNS.

Prices and Cuts on Application.

PAGE BROS. & CO.

347 to 357 Cambridge St. Boston, Mass.

C. H. McCUTCHEON,

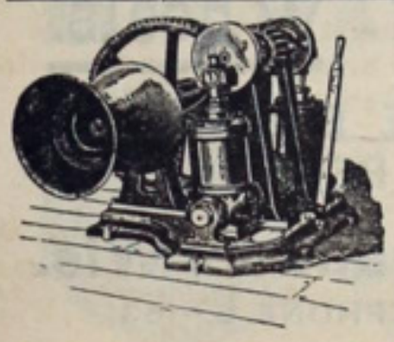
(Successor to SAMUEL McCUTCHEON.)

Copper, Tin and Sheet Iron Manufactory,

Steamboat and Engineers' Supplies.

All kinds of Brass Cocks, Globe Valves and Couplings, &c. Iron Pipe and Fittings, and Mill Supplies. Rubber Belting, Hose and Packings, Springs, Valves, &c., Leather Belting and Usudurian Packing.

Telephone No. 68. **No. 18 Ohio Street, BUFFALO, N. Y.**

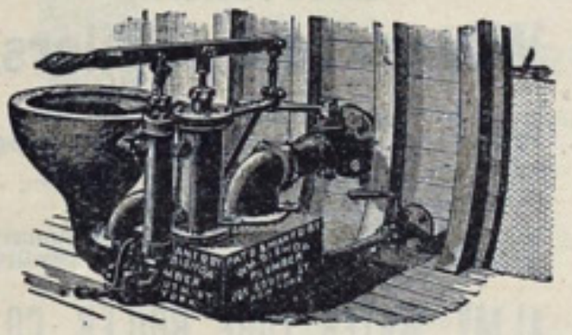


Hoisting Engines.

We build them in all sizes from new and improved designs Every engine thoroughly tested before leaving our shop, and guaranteed to be satisfactory in every case. When in want of a Hoist for marine work, dock work, mining or any other purpose, kindly permit us to name you prices. We know we can please you.

Marine Iron Co., Bay City, Michigan.

Patent Pump Water Closet.



For Yachts, Pilot Boats, Naval Ships, Etc.

For above or below water line. In use on U.S. Cruiser New York, Columbia, and Battleships Indiana, Maine, Texas, Massachusetts, Etc. Our No. 4 can be put in a space 14 in. x 15 in.

WILLIAM BISHOP & SON,

265 South St., NEW YORK.
724 Third Av., BROOKLYN.
Telephone 569 Franklin.

Yacht Fittings a Specialty.

MIERS CORYELL

21 E. 21st Street, NEW YORK.

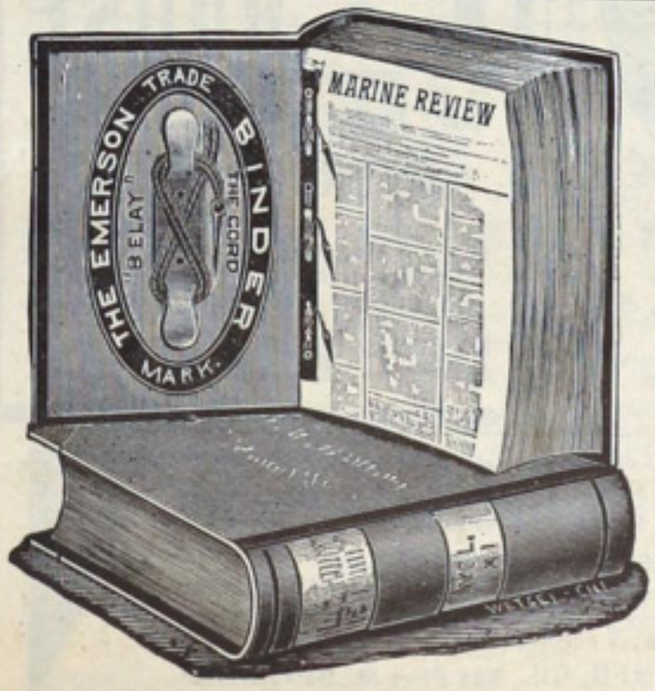
Consulting Mechanical Engineer,

Plans, Specifications and Superintendence. Marine and Water Works Engines and Boilers.

We claim the following merits for **JENKINS BROS.' VALVES.**

1. Manufactured of the best Steam Metal. [Valves.
2. No regrinding, therefore not constantly wearing out the Seat of the
3. Contain JENKINS DISC, which is suitable for all Pressures of Steam, Oil, and Acids.
4. The Easiest Repaired, and all parts Interchangeable.
5. Every Valve tested before leaving the factory.
6. ALL GENUINE stamped with Trade Mark.

JENKINS BROS. New York, Philadelphia, Chicago, Boston.



ONE OF THESE BINDERS

that will hold 52 NUMBERS of the

MARINE REVIEW,

Will be mailed to any address on receipt of $1.

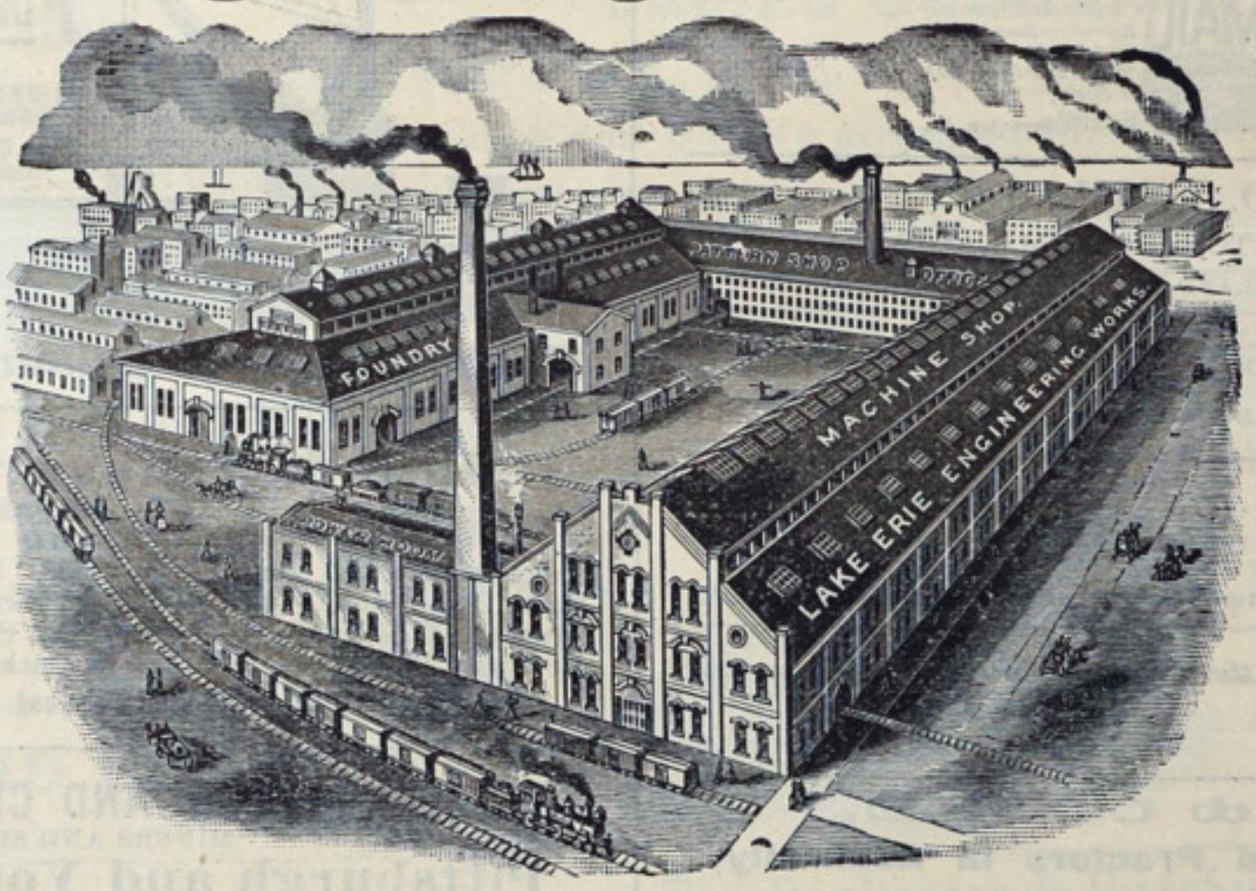
MARINE REVIEW . . .

409 Perry-Payne Bldg.,
CLEVELAND, O.

Lake Erie Engineering Works, Buffalo, N. Y.

RICHARD HAMMOND, Pres't. JOHN COON, Sec'y and Treas.

Steam Engines, Compound, Triple and Quadruple Expansion Engines, From 250 to 10,000 Horse Power For Marine and Stationary Service.



Special Designs for Cable Railways and Electric Power Plants.

The Best Economy and Regulation Guaranteed.

THE BEST EQUIPPED PLANT IN AMERICA.

MARINE VALVE OIL FOR INTERNAL LUBRICATION. RENOWN ENGINE OIL FOR EXTERNAL LUBRICATION

Marine Valve, Renown Engine, Eldorado Engine, Crank Case, Victor Signal, Dark Lubricating, Mineral Seal, Head Light, Artic Cup Greases, and Lard Oils.

— CARRIED IN STOCK AT THE —

STANDARD OIL COMPANY'S MARINE DEPOT,

TELEPHONE 77. **123 River Street, CLEVELAND, O.** MAIN OFFICE TELEPHONE 682.

ALSO FOR SALE BY **STANDARD OIL COMPANY,**

Chicago, Ill., No. 5 Wabash Ave.
Racine, Wis.
Milwaukee, Wis., Broadway & Mason.
Sheboygan, Wis.
Manitowoc, Wis.
Green Bay, Wis.
Marinette, Wis.
Oshkosh, Wis,
Duluth, Minn,
West Superior, Wis.
Hancock, Mich.
Marquette, Mich.
Buffalo, N. Y.
Sault Ste. Marie, Mich.
West Bay City, Mich., M. C. Ry. & 10th St
Saginaw, Mich., Eighth & Sears Sts.
Detroit, Mich., 46 Jefferson.
Toledo, O., Summit & Monroe Sts.

ATLANTIC REFINING COMPANY, French & 16th Sts., Erie, Pa.
D. ROBESON, Port Huron, Mich.
W. S. MCKINNON, Ashtabula Harbor, O.
HULL & RAND, Huron, O.
EDWARD BRAMMALL, Bnton Harbor, Mich.
BABY & DALE, St. Clair, Mich.
N. C. ALTEN, Lorain, O.
A. F. HARRINGTON, Conneaut Harbor, O.
A. H. MCGONAGIL, South Chicago, Ill.
MARINE SUPPLY CO., Fairport, O.
F. KRANZ, Sandusky, O.
THE M. I. WILCOX CORDAGE & SUPPLY CO., Toledo, O

HANDSOME PHOTOGRAPHS AT REDUCED PRICES.

We have been selling 11x14 photographs taken in Detroit River for $1.50 each. For the next ten days we will sell prints of the following at $1.00 each, the price on others remaining the same :

Commodore
Pontiac.
Spokane.
Centurion.
Edwards and Golden Age.
Kearsarge.
Geo. Spencer and Pennington.
Scranton.
Majestic.
Sir Henry Bessemer.
Stafford.
Northern Light.
Republic.
Gladstone.
Frontenac.
J. H. Devereaux.
Eber Ward.
John Harper.
Fred Pabst.
Tom Adams.
Bielman.
Siemens.

Having more than one of each of these, this price is made to reduce the stock.

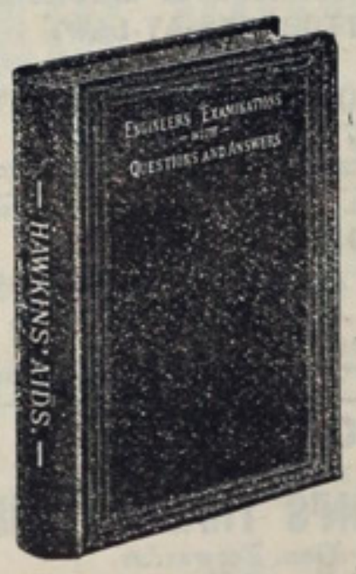
MARINE REVIEW, Cleveland, O.

An Opportunity for ENGINEERS!

An Indicator for Sale Cheap.

Calkins Steam Engine Indicator, Planimeter, Pantograph extra springs, and three way cock—full outfit for taking indicator cards — regular price $40 — our price $35.

MARINE REVIEW,
516 Perry-Payne Bldg., Cleveland, O.



"Engineers' Examinations"

With Questions and Answers.

Printed on heavy paper and bound in red leather.

Anv young engineer, greaser or fireman ought to have it.

Sent postpaid to any address, on receipt of $2.00.

MARINE REVIEW,
410 Perry-Payne Bldg.. Cleveland, O.

"Maxims and Instructions for the Boiler Room," $2.50
"Hand-Book of Calculations for Engineers,"..... 2.50

..STEAM.. ENGINEERING (Loco., Stat'y. and Marine); Electricity; Mechanics; Mechanical and Architectural Drawing; Plumbing; Architecture; Mining; Civil Engineering in all Branches.

The International Correspondence Schools

To Steam.. ..Engineers, Machinists, Electrical Workers, Civil Engineers, Draughtsmen, Steam Fitters, Miners, Carpenters, Plumbers. *References Everywhere. Send for Circular. State Subject you wish to Study,* Box 965 Scranton, Pa.

HARVEY D. GOULDER,
LAWYER AND PROCTOR IN ADMIRALTY,
CLEVELAND, O.

ALBERT J. GILCHRIST, PROCTOR IN ADMIRALTY,
No. 604 PERRY-PAYNE BLDG., CLEVELAND, OHIO.

AMBROSE V. POWELL, C.E., * * Consulting Engineer.
Specialties: Designing and Construction of DRY DOCKS, Harbor Works, Docks and Plants for Handling Coal and Ore.
Office, 507 Chamber of Commerce, - CHICAGO, ILL.

C. E. KREMER, *Attorney and Counselor-at-Law and Proctor in Admiralty.*
Rooms 14, 15 and 16, Bryan Block, 164 LA SALLE ST., CHICAGO, ILL.

BROWN & COOKE,
Counselors at Law and Proctors in Admiralty,
34-35-36 White Building, BUFFALO, N. Y.

HAWGOOD & MOORE W. A. HAWGOOD. J. W. MOORE.
Vessel and Insurance Agents,
Residence Phone, Doan 446—W. A. Hawgood.
Long Distance Tel. 2395. 608 Perry-Payne Bldg., CLEVELAND, O.

W. C. RICHARDSON,
VESSEL AND MARINE INSURANCE AGENT.
Office Telephone 338.
Residence Telephone 2938. Nos. 606 & 607 Perry-Payne Bldg., Cleveland, O.

C. F. PALMER. C. L. HUTCHINSON.
PALMER & CO.,
VESSEL AGENTS AND UNDERWRITERS,
Telephone 644. 515 and 516 Perry-Payne Bldg., Cleveland, Ohio.

J. H. BARTOW, TELEPHONE 717.
Vessel and Insurance Agent,
611 and 612 Perry-Payne Bldg., Cleveland, O.

ALEX. CLARK. J. B. HALL. J. H. KILLERAN, *Marine Surveyor.*
A. Clark & Co. VESSEL AND INSURANCE AGENTS,
Tel. No. 892. 55 Main St., BUFFALO, N.Y.

JOHN MITCHELL. JOHN F. WEDOW. ALFRED MITCHELL.
MITCHELL & CO.,
Vessel and Insurance Agents,
508, 509 and 510 Perry-Payne Building, CLEVELAND, OHIO
Office Telephone, 737. Residence, John Mitchell, 3506.

C. R. JONES & CO., VESSEL AGENTS,
FIRE AND MARINE INSURANCE.
Nos. 501, 502 and 503 Perry-Payne Bldg., CLEVELAND, O.

ORESTES C. PINNEY,
Lawyer and Proctor in Admiralty.
Rooms 722 and 723 Perry-Payne Bldg.
CLEVELAND, OHIO.
Telephone 2585.

C. W. ELPHICKE. JAS. A. MYERS. A. L. FITCH.
C. W. ELPHICKE & CO.
GENERAL INSURANCE AGENTS,
Room 10, No. 6 Sherman St., Chicago, Ill.

PATENTS

QUICKLY SECURED. Trade-marks and Copyrights registered and patent business of every description promptly and skillfully conducted at lowest rates. Inventions introduced, companies formed, and PATENTS SOLD ON COMMISSION. 25 years' experience. Highest references. Send us model, sketch or Photo. of invention, with explanation, and we will report whether patentable or not, free of charge. OUR FEE PAYABLE WHEN PATENT IS ALLOWED. When patent is secured we will conduct its sale for you without extra charge. 32-PAGE HAND-BOOK and list of 200 inventions wanted mailed to inventors free upon request. This is the most complete little patent book published and every inventor should WRITE FOR ONE.
H. B. WILLSON & CO., Patent Solicitors, Le Droit B'ld'g. WASHINGTON, D. C.

J. J. H. Brown. Edward Smith. J. B. Rodgers.
BROWN & CO.,
Vessel and Insurance Agents,
202 Main St.,
BUFFALO, N. Y.

White, Johnson & McCaslin,
ATTORNEYS-AT-LAW,
—AND—
Proctors in Admiralty,
26-27 Blackstone Building,
CLEVELAND, - OHIO.

J. T. ROSE. FRANK B. LAZIER.
ROSE & LAZIER,
Vessel Agents and Brokers, and Marine Insurance,
16 Board of Trade,
DULUTH, - - MINN.

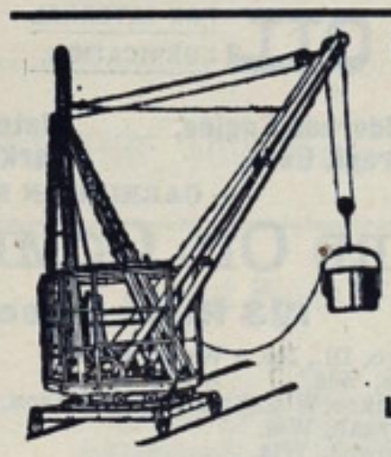
THOS. WILSON,
MANAGING OWNER
WILSON'S TRANSIT LINE.
Gen. Forwarder.
Freight and Vessel Agent.
CLEVELAND, O.

Pickands, Mather & Co.,

FUEL LIGHTERS AT BUFFALO, ERIE, ASHTABULA AND CLEVELAND.
At DETOUR, MICH., A FUEL DOCK equipped with Shute capacity of 600 Tons.
Best Quality PITTSBURGH COAL furnished at any time during Day or Night.
Western Reserve Building, CLEVELAND, O.

Ohio & Pennsylvania Coal Co.
FUEL DEPARTMENT.
MINERS AND SHIPPERS,
Youghiogheny and Ohio Steam Coals. Steamboats, Tugs, etc., Coaled day or night, DOCKS FOOT WEST RIVER STREET. WHISKEY ISLAND GOVERNMENT PIER and C. & P. R. R. SLIPS. Also STEAM LIGHTER—Equipped with Revolving Derrick and (100) two ton buckets.
Telephone 1608. Office, 130 West River St., CLEVELAND, OHIO.

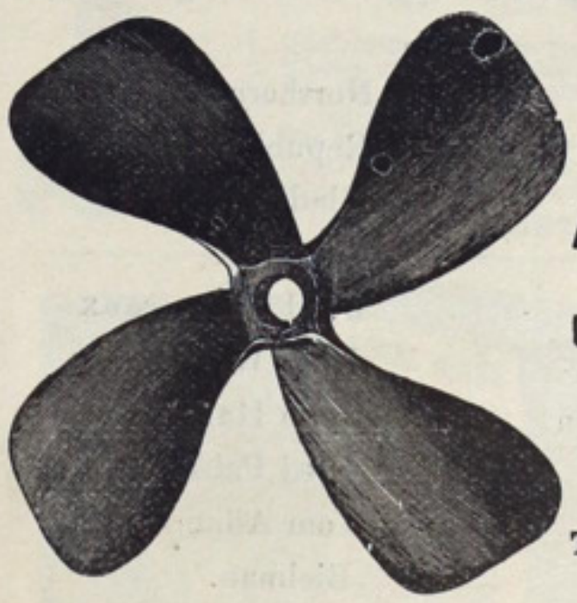
THE PITTSBURGH AND CHICAGO GAS COAL CO.
MINERS AND SHIPPERS OF
Pittsburgh and Youghiogheny Coal.
Fuel Docks West Side of Main River, Cleveland, Ohio, just above Main St. Bridge.
Latest equipment for rapid fueling of Steamers at all hours, day or night.
Fuel Lighter 300 tons capacity; buckets 2½ tons capacity.
Telephone { Office 1888. Fuel Dock 1590. Ore Dock, 2413.
J. A. DONALDSON, Agent, 420-421 Perry-Payne Building.



TOLEDO FUEL CO.,
Cambridge, Hocking, Jackson and Massilon Coal
Wheeled on or put on with DERRICK.
NIGHT OR DAY.
SATISFACTION GUARANTEED.
H. H. WLLIIAMS, Manager.
Located on Penn. Dock, TOLEDO. O.
GET OUR PRICES. Phone 1441.

H. A. BARR, PRESIDENT, Escanaba. F. H. VAN CLEVE, SEC. Escanaba. CAPT. GEO. BARTLEY, SUPT. Escanaba.
ESCANABA TOWING & WRECKING CO., Escanaba, Mich.
Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks and Diving Appliances always ready.
TUG MONARCH, Engine Compound, Cylinder 16 and 30 inches diameter, 30 inch Stroke, Steam Pressure Allowed, 125 pounds.
TUG DELTA, Cylinder 20 by 22, Steam Pressure Allowed, 105 pounds.
TUG OWEN, Cylinder 20 by 20, Steam Pressure Allowed, 104 pounds.
CENTRIFUGAL PUMPS, Seven and Fourteen Inch Suction

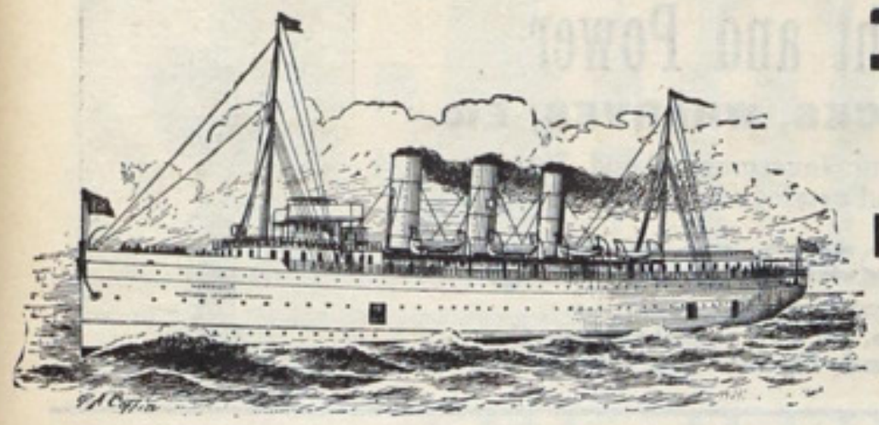
H. G. TROUT,
KING IRON WORKS,
BUFFALO, N. Y..
MANUFACTURERS OF
TRIPLE EXPANSION, THREE CYLINDER, FORE AND AFT And STEEPLE COMPOUND MARINE ENGINES,
High and Low Pressure Engines, Sectional. Propeller, Tug and Yacht Wheels,
Cowles Aluminum and Manganese Bronze Propeller Wheels.



These Wheels are noted for their extra speed, towing power and proportionate saving of coal.
PRICES QUOTED ON APPLICATION.

A CHART OF THE WHOLE OF GEORGIAN BAY,

The best thing of its kind as yet published, has recently been issued by the British admiralty, and may be had from the MARINE REVIEW, No. 409 Perry-Payne building. Another chart, of a very clear and interesting kind, taking in Lake Huron, Georgian Bay, Lake Erie and connecting channels has also been issued recently by the same authority.



RAPID FUELING DOCKS, DETROIT RIVER.

JAMES GRAHAM & CO.,

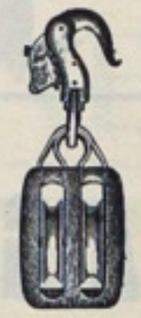
Foot Twenty-first St., Detroit, Below Routes of Passenger and Car Ferry Lines.

Pockets and Chutes arranged for different types of vessels.

BEST STEAM COAL. Large Supplies and every effort to give dispatch, day and night. Wide stretch of river for tows, and plenty of water at dock at all times.

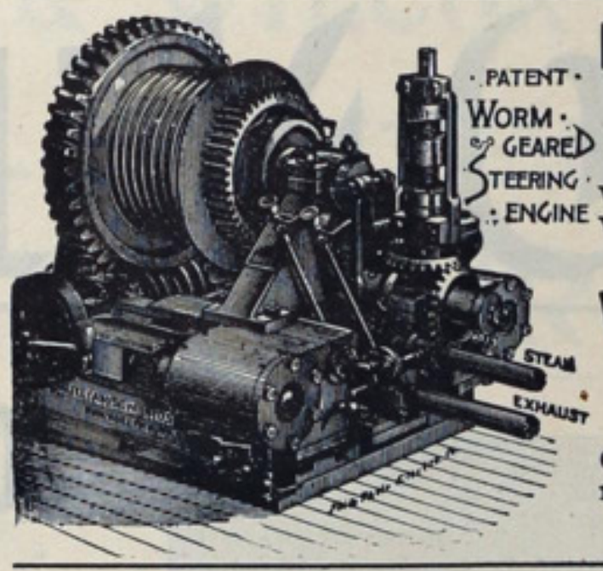
Farrell's Patent Self-Detaching Hook for Davitt Tackle

Prevents the up-setting of the boat in lowering same in a heavy sea, by operating same from the deck, instantaneously disengaging the fall from the boat at the proper moment when it reaches the water.



BAGNALL-LOUD BLOCK CO.

162 Commercial Street, BOSTON, MASS.



Hoisting and Steering ENGINES.

With either Frictional, Spur or Worm Gear of various patterns to suit all purposes.

Williamson Bros.

Richmond and York Sts.
PHILADELPHIA, PA.

Over 150 of the largest and most modern lake steamers have our steerers.

THE W. L. SCOTT CO.

Wholesale Dealers in

Shamokin, Wilkesbarre, and Hazleton-Lehigh

COALS.

Mansfield Steam Coal.

FUELING VESSELS a specialty, either from dock or steam scow **Mansfield**, capacity 300 tons, in buckets, which gives quick dispatch. Boats coaled day or night. Docks lighted with electricity and equipped with steam derricks.

Fueling Office at Canal Dock, ERIE, PA.

The Rochester & Pittsburgh Coal & Iron Co.

Reynoldsville Coal.

STEAMBOAT FUEL DOCK. Blackwell Canal at Michigan St. Bridge.

1400 Feet Dock Frontage.

Steam Elevator and 4 Steam Derricks. Steam Fuel Scow, Capacity 550 Tons. Boats Coaled Day or Night.

OFFICE: 694 Elliott Square Bldg., BUFFALO, N.Y.

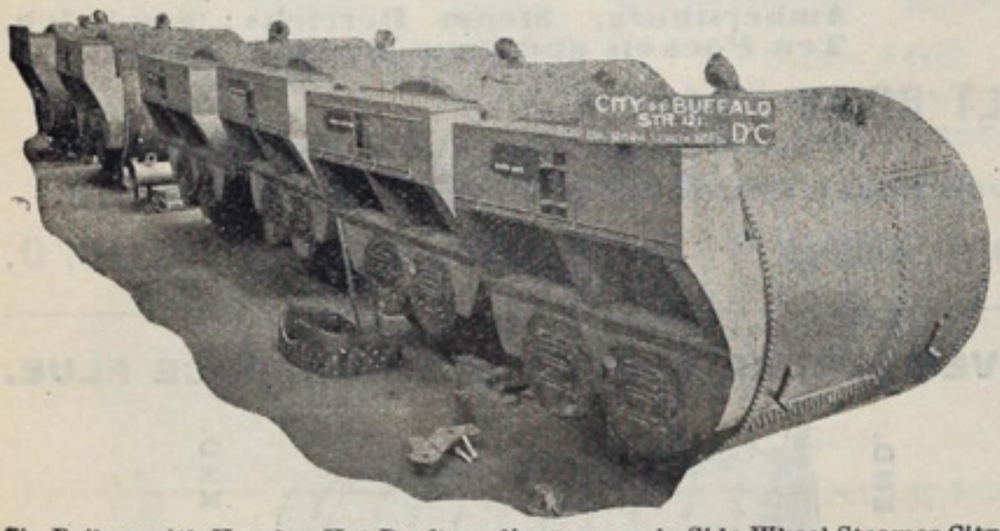
TELEPHONES:
Ellicott Square Bldg., Seneca 371 A. Dock, Seneca 371 D.

WM. H. HAZEN, Dock Superintendent.

Air is Cheap—Cheaper than Dirt!

FUEL IS DEAR—VERY DEAR!

USE AIR AND SAVE FUEL!



Six Boilers with Howden Hot Draft appliances now in Side-Wheel Steamer City of Buffalo. Dimensions of each boiler—12 ft. 6 in. diameter by 12 ft. length.

ECONOMY in operating expenses on Lake Ships must come from reduced coal bills. No great saving can be made in labor cost, and provisions are already low. But fuel bills can be lowered and cheap coal used to advantage by adopting Modern Methods of making steam at low cost.

No manufacturer of pig iron would to-day think of running his furnace without a hot blast. Competition would not permit it. This same competition demands advanced practice in the operation of ships. The same principle is applied in the

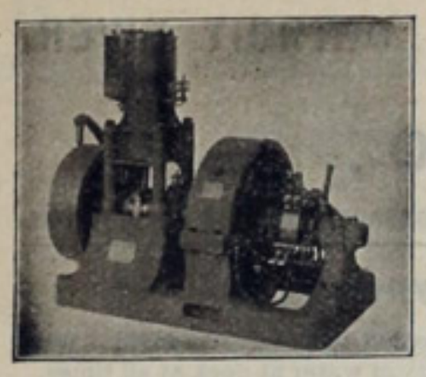
HOWDEN HOT DRAFT

Now in use on Lake Steamers aggregating over 40,000 Horse Power.

CAN BE APPLIED TO OLD SHIPS AS WELL AS NEW ONES.

No complicated machinery. Cool engine rooms and cool fire holds. Estimates readily furnished for application of this draft to any steamer.

DRY DOCK ENGINE WORKS, DETROIT, MICH.



Complete Electric Plants for Light and Power

On STEAMSHIPS, WHALEBACKS, YACHTS, DOCKS, WHARVES, Etc.

Our system is complete in every detail. All our appliances are made to Governmental and Insurance requirements and are perfect. Write for prices and catalogues.

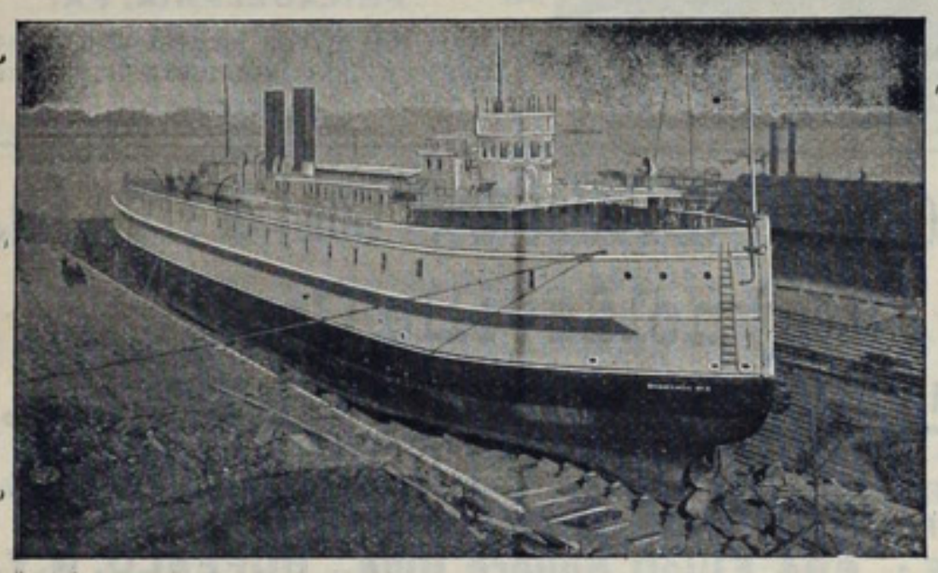
General Electric Company.

SALES OFFICES

Schenectady, N. Y. Chicago, Ill. Detroit, Mich. Buffalo, N. Y. Columbus, O.
Boston, Mass. Philadelphia, Pa. Baltimore, Md. Portland, Ore. San Francisco, Cal.
New York, N. Y. New Orleans, La.

FRONTIER IRON WORKS

MARINE ENGINES,
DETROIT, MICH.



Shenango No. 2, 300 feet long, 54 feet beam.

CRAIG SHIP BUILDING CO.

TOLEDO, OHIO,

Metal and Wooden Ship Builders.

New Dry Dock—450 feet long, 110 feet wide on top, 55 feet wide on bottom, 16 feet of Water on Sill.

Repairs to Metal and Wooden Ships
A Specialty.

THE BETHLEHEM IRON COMPANY,

Works and Principal Office,
South Bethlehem, Penn.

PLATES for all purposes made from HIGH GRADE OPEN HEARTH STEEL.

NEW YORK OFFICE, - - 100 Broadway.
PHILADELPHIA OFFICE, - 421 Chestnut St.
CHICAGO OFFICE, - - Marquette Bldg.

The United States Standard Register of Shipping.

Providing the only Standard Classification based on Construction Rules Designed for Lake Vessels.
Classed Vessels Receive the Lowest Rates of Insurance.

SURVEYORS.

SINCLAIR STUART, Surveyor of Iron and Steel Construction and Engineer Surveyor.

.....Surveyor for District comprising Lakes Superior, Michigan and Huron and Lake Erie, as far East as, and including Cleveland, O.

EDWARD CASKIN, Potter Building, Main Street, Buffalo, N. Y., Surveyor for District comprising Lake Ontario and Lake Erie, as far West as, but not including Cleveland, O.

Application for survey of vessels and subscriptions to Register Book will be received by the surveyors or at the office of

The United States Standard Steamship Owners', Builders' & Underwriters' Ass'n, Ltd.
Post Building, 16 and 18 Exchange Place, . NEW YORK.

Cuddy-Mullen Coal Co.

Lake Shippers of Steam Coal.

FUELING DEPARTMENT FACILITIES:

CLEVELAND HARBOR—
Car Dumper; Eight Pockets; Three Steam Derricks; Lighter.

DETROIT RIVER BRANCH—
Amherstburg, Steam Derricks; Sandwich, Ten Pockets and Two Steam Derricks.

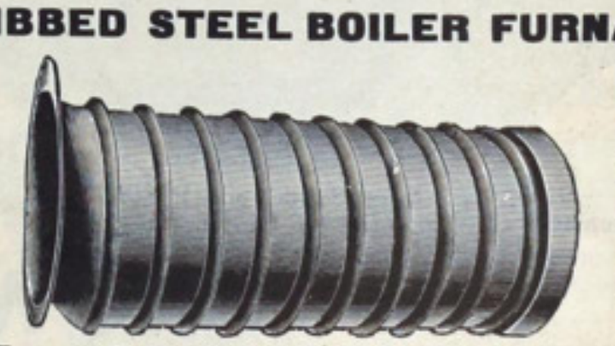
SAULT RIVER BRANCH—
Pocket Dock now under construction.

Good Coal; Courteous Attention; Quick Dispatch.

General Offices: Perry-Payne Bldg., Cleveland, O.

PURVES' RIBBED STEEL BOILER FURNACE FLUE.

BACK END.



FRONT END.

With this style of Furnace Flue, the rivets at the "back end" are out of the line of fire, and all that has to be done to remove it is to cut out the rivets at the ends and slip it through the front; and to replace it, simply to slip it back in its place and rivet up the ends again without disturbing any other part of the boiler. No smith work is required to fit it in a boiler or to refit it when replaced. It is ready for use as it comes from the manufacturers. This style of Flue has been in use six years without a single complaint.

Over 16,000 of Purves' Ribbed Steel Furnace Flues in successful use in Marine Boilers.

ELLIS & EAVES SYSTEM OF INDUCED OR SUCTION DRAFT.

CHARLES W. WHITNEY,
Sole Agent for the United States and Canada,
Manhattan Life Building, 64, 66 and 68 Broadway, New York.

S. F. HODGE & CO.

MARINE ENGINES,
PROPELLER WHEELS,
DECK HOISTERS,
MARINE REPAIRS.

320 ATWATER STREET,
DETROIT, MICH.

THE BABCOCK & WILCOX CO.

FORGED STEEL WATER-TUBE MARINE BOILER,

29 CORTLANDT ST., NEW YORK.

Boilers sold to United States Merchant Marine and Yachts - - - - - - 16,500 H. P.
Boilers sold to United States Navy - - - - - - - - - - 7,500 "
The onlv Water-tube Boiler in the British Merchant Marine 15,500 "

BAR IRON — THE BOURNE-FULLER CO. — PIG IRON

CLEVELAND, O.

SHIP PLATES, BOILER PLATES,
ANGLES, BEAMS, CHANNELS, BARS,
BOAT SPIKES, CLINCH RINGS,

SALES AGENTS:

THE CAMBRIA IRON CO.

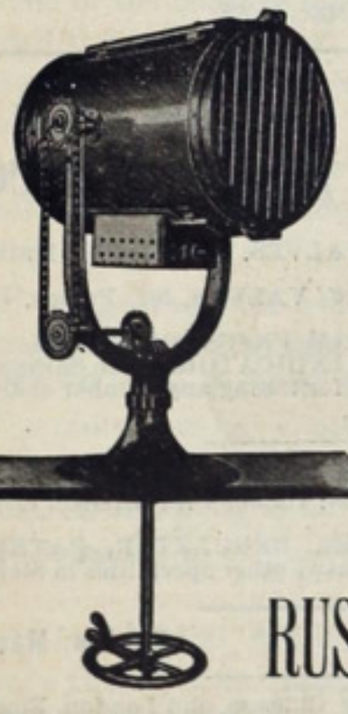
Mfrs. of Open Hearth and Bessemer Steel.

De Grauw, Aymar & Co.,
34-35 South Street,
NEW YORK, N. Y.

Sole Selling Agents in the United States for

TYZACK'S
STOCKLESS ANCHORS

Over 100 of these Anchors on Lake Vessels.



Type D. Pilot House.

PROJECTORS!

10 MILLION TO
100 MILLION
CANDLE POWER.

Theonly successful commercial light

Adopted and endorsed by leading steamship lines and builders.

Have Replaced All Other Makes.

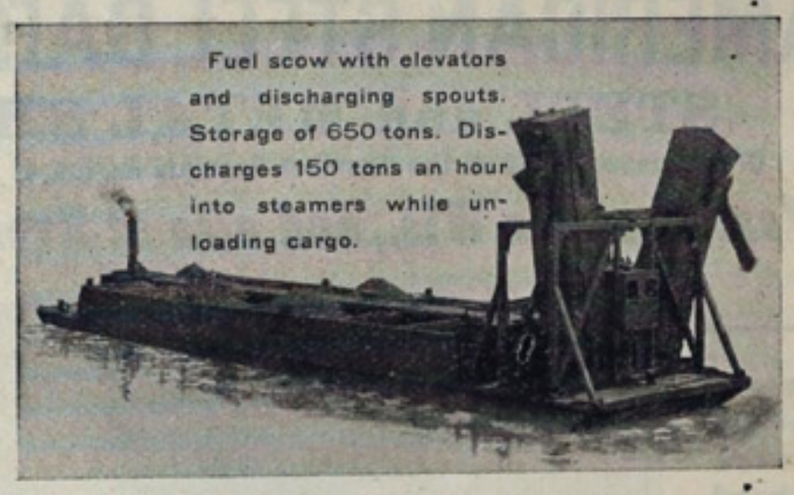
CATALOG NOW READY.

RUSHMORE DYNAMO WORKS,
JERSEY CITY, N. J.

Steamboat Fuel at Ashtabula.

Large Supplies of Best Quality.

Lighter Carrying Different Grades at all Times.



Fuel scow with elevators and discharging spouts. Storage of 650 tons. Discharges 150 tons an hour into steamers while unloading cargo.

M. A. HANNA & CO.,

Main Office, Perry-Payne Bldg., Cleveland. Miners and Shippers.

THE GEO. F. BLAKE MFG. CO.

AIR PUMP OR U.S. CRUISER NEW YORK.

BUILDERS OF

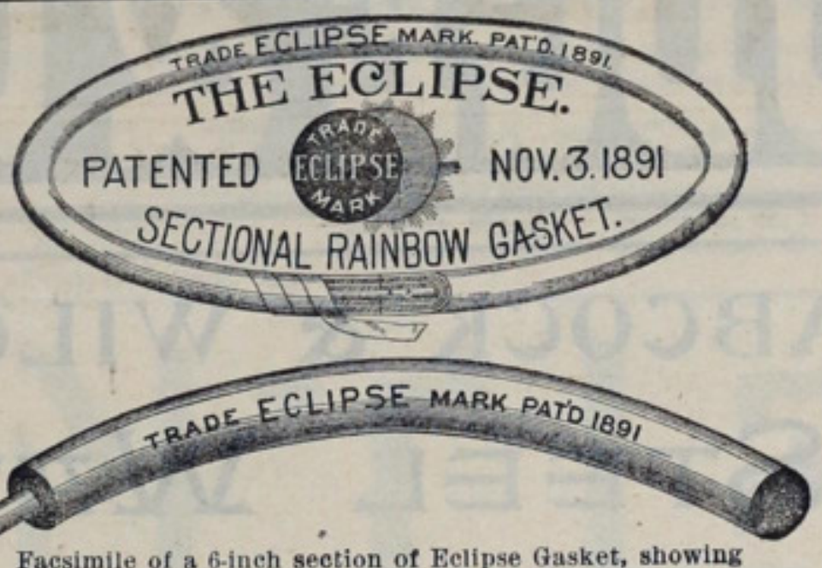
MARINE PUMPS

Single and Duplex Pumps for Boiler Feed, Fire or Bilge Service—Vertical and Horizontal.
Vertical and Horizontal Pumps, Air Pumps for Surface and Jet Condensers.

95 and 97 Liberty St., NEW YORK.

ECLIPSE SECTIONAL RAINBOW GASKET.

3/8-INCH FOR PIPE UNIONS.
1/2-INCH FOR HAND HOLES.



Facsimile of a 6-inch section of Eclipse Gasket, showing name and trade mark imbedded.

5/8-INCH FOR REGULAR SIZE.
3/4-INCH FOR LARGE SIZE.

MAN HOLES.

Patented and Manufactured Exclusively by

PEERLESS RUBBER MFG. CO.,

16 Warren Street,

NEW YORK.

Write for Testimonials.

16-24 Woodward Ave., DETROIT, MICH.

193-195 Bank St., CLEVELAND, O.

202-210 So. Water St., CHICAGO, ILL.

STERLING, WELCH & CO.

12 and 14 Euclid Ave., CLEVELAND, O.

BOAT FURNISHING A SPECIALTY.
CARPETS, OIL CLOTHS,
CURTAINS, &c., &c,,
SUPPLIED AT WHOLESALE RATES.

The Cleveland Dry Dock Co.

148 Elm St., Cleveland, O.
Telephone 1616.
Resid. 'Phone 3634.

REPAIRING A SPECIALTY.

Dimensions of Dock:
Lth. over all, 360 ft.
Lth. on blocks, 340 ft.
Width of gate, 50 ft.
Depth over sill, 20 ft.

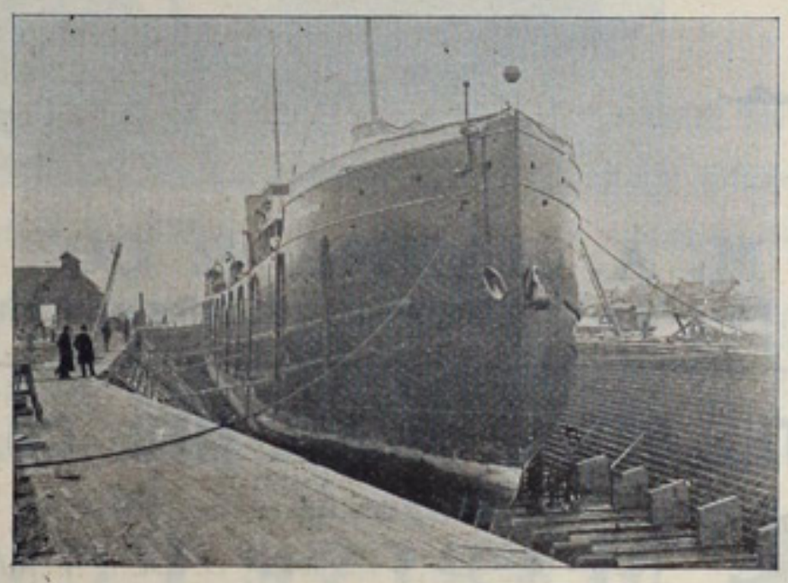
Capt. W. W. BROWN, Sec'y & Mgr.

AMERICAN STEEL BARGE CO.

STEEL and METAL SHIPS

Of all classes built on the Shortest Possible Notice at our yards at

West Superior, Wis., and also at Everett, Wash.



Plates & Material Always on hand to Repair all kinds of Metal Ships in Shortest Time.

Best Quality of Oak instock for Repairing Wooden Vessels of all Classes.

SIZE OF DOCK.

Length, extreme.....537 feet.		Entrance, Top.....55 feet 9 in	
Breadth, Top 90	" 4 in.	Entrance, Bottom.....50	"
Breadth, Bottom 52	"	Depth over Sills 18	"

LARGEST DRY DOCK ON THE LAKES.

Prices for Repairs and Docking same as at lower lake ports

SUPERIOR, WIS.

A number of Propellor Wheels in stock at Dry Dock.

C O A L

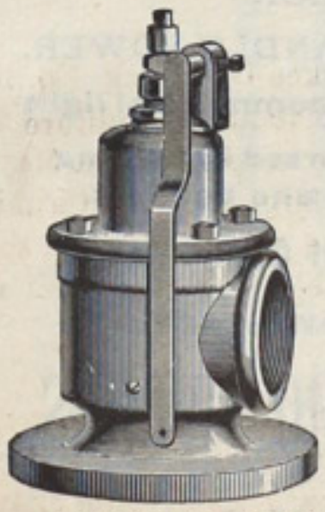
STANLEY B SMITH & CO.
OPERATING
SMITH'S COAL DOCK
POCKET FUELING AND LOW DOCK,
DETROIT, MICH.
OFFICES: DETROIT MICH.
LORAIN COAL DOCK
OPERATING
LAKE SHIPPERS OF STEAM COAL.
LORAIN, OHIO.
STEAMBOAT FUELING

C O A L

U. S. ENGINEER OFFICE, Hickox Building, 185 Euclid Ave., Cleveland, O., March 1, 1897. Sealed proposals for repairing west breakwater at Cleveland Harbor, Ohio, under continuous contract, will be received here until 2 o'clock P. M., Standard time, Friday, April 2, 1897, and then publicly opened. Information furnished on application to JARED A. SMITH, Col., Engrs.

Mar. 18, 25.

CROSBY STEAM GAGE AND VALVE CO.



CROSBY POP SAFETY VALVES. Locomotive, Marine and Stationery.
CROSBY WATER RELIEF VALVES, for Pumps, Hydrants, etc.
CROSBY IMPROVED STEAM PRESSURE GAGES.
CROSBY STEAM ENGINE INDICATORS, with Sargent's Electrical Attachment for taking any number of Diagrams simultaneously.

The Original SINGLE BELL CHIME WHISTLES.
BRANDEN PUMP VALVES; rubber with wire-coil insertion.
BOSWORTH FEED-WATER REGULATOR, PATENT GAGE TESTER, and many other specialties in Steam Lines.

Main Office and Works: Boston, Mass.

Stores: Boston, New York, Chicago, and London, Eng.

WE WILL REPAIR YOUR STEAM FITTINGS PROMPTLY.